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The AUTOMOBILE

S. A. E. Closes Successful Summer Session at Cape May

Accepts in Whole or Part Reports of Five Standards Divisions—Seven Report Progress—Valuable Papers

By J. Edward Schipper

CAPE MAY, N. J., June 26.—Today ended the programme of the 4-day convention of the Society of Automobile Engineers, held at the Hotel Cape May. Combining a list of important business and professional sessions with an intermixture of successful social and entertainment features the Summer meeting of 1914 has been a success which has rarely been surpassed in the history of the society.

While the attendance this year of members and their families hovered closely around the 300 mark, whereas in previous Summer sessions held in the Middle West, the attendance has been fully 50 per cent. greater, yet for pithiness and importance of discussion and in the value of the papers read, the meeting was all that could be desired from a business and social standpoint. Not a drop of rain marred the perfect weather of the 4 days, and full advantage was taken by all those present of the beautiful seashore site selected as the meeting place.

The three broad lines of endeavor of the society, namely: Standardization, research and the promotion of social acquaintanceship, each received its full share of attention from the members who attended. Standardization work was represented by the reports from twelve divisions of the Standards Committee, which met on Tuesday, the first day of the convention, and which forwarded the results of their work to the society at large during the session which followed. Nine reports of progress or reports on definite standards suggested were put up before the meetings for final acceptance. The result of the discussions on the reports of these divisions were the adoption of several new standards which will not be put into the hands of engineers through the medium of the S. A. E. data sheets.

The work of research was represented by a programme of thirteen papers on varied subjects. These papers which covered timely topics such as a study of the tire situation from both the passenger and truck standpoint, electric starting, lighting and ignition devices, the desirable features to be incorporated in the ideal car, etc., were not only of the highest educational value themselves, but provoked discussion which

S. A. E. ACCOMPLISHED

Standardization

1—Iron and Steel Report Adopted.

2—Report of Broaches Division.

3—Report of Motor Testing Division.

4—Standard Rim Tests Accepted.

5—Insulation Tests Are Adopted.

Papers

6—Seventeen Papers Are Presented.

7—Valuable Discussions Resulted.

8—Papers of Instructive Value.

9—Papers Follow Standards Work.

Business

10—New Constitution Is Adopted.

11—New Members Added Number 207.

12—Student Enrollment Is Accepted.

Group of those present on the front veranda of the Hotel Cape May on the last day of the session

will make a valuable addition to the transactions of the society. In the instance of the papers on tires the work of the pleasure car wheels division of the standards committee was closely followed—and the papers served as an excellent educational medium to clearly bring out what is required of the standards committee in their adoption of higher dimensions and rim requirements.

Bathing scene on the beach at Cape May

The same holds true of the paper giving a general summary of the truck tire situation, and that on tap drill sizes and causes of stripped threads. These two papers follow the work of the truck standards and miscellaneous divisions, which are covering respectively the requirements of truck tires and the fit in tapped holes.

The social end of the programme at the convention furnished the relaxation essential to an efficient consideration of the entire business programme. In addition to all that the hotel, especially designed to meet the requirements of those engaged in the pursuit of pleasure, could afford, there were the sports and amusements provided by the entertainment committee of the society. Never before had sports been given such an amount of study as in this summer meeting, and the result was that they were more heartily entered into and more thoroughly enjoyed than in previous summer meetings. Outside of the swimming, dancing and entertainments by the sections of the society during the evenings of the convention, there was at the close of the business session a complete programme of athletic field sports for which the sports committee had provided a series of handsome prizes. This arrangement induced a spirit of friendly competition and went far towards making the meeting the all-around success that it was.

Henry Souther, Standards Chairman

When the midsummer meeting of the society opened at 2 P. M. Wednesday in the ballroom of the Hotel Cape May, with President Leland presiding, the Mayor of Cape May, introduced by Coker F. Clarkson, secretary of the society, extended the freedom of the city

to the guests in the presence of an interested audience of 200 engineers. After the close of President Leland's address, which was reported in last week's issue of THE AUTOMOBILE, Mr. Clarkson read a letter from T. B. Browne, President of the British Institution of Automobile Engineers, presenting the society with a beautiful reading table as a pleasant reminder of the visit paid by members of the institution on the occasion of the joint midsummer meeting of the two societies held on board the City of Detroit III, last summer, while cruising the Great Lakes. The society by a unanimous rising vote passed a resolution to forward a suitable reply to the English engineers.

Howard Coffin, of the Hudson company

The report of the treasurer, Hermann F. Cuntz, was read by Mr. Clarkson. The report showed total receipts of $31,691.63; $2,412.95 of this was in cash on hand and in bank and $29,278.68 in the form of receipts. The disbursements amounted to $30,127.76, leaving a balance of $1,563.87.

The report of the tellers of election showed a gain in membership since the January meeting of 207. The increase in actual members of the Society number 76, increase in associates 106, in Juniors 15, affiliates 7, and departmental 3. This shows the membership of the Society to be steadily growing.

Of considerable importance to the Society is the adoption of the proposed amendments to the constitution as determined at the January, 1914, meeting. The two articles which caused the most discussion were those dealing with the composition of the nominating committee. After considerable debate an entirely new article was formulated by which the nominating committee will have seven members, three of whom will be elected by the sections of the society, each section having the power to choose one member of the committee, and the four other members will be elected by the Society at large. In the event of there being more than three sections, the three having the greatest membership shall have the choice of the three members of the committee to be elected by the sections.

Another important feature brought up at the business end of the meeting before the regular professional session was started was the question of student enrollment. It was suggested that a paragraph be added to that article of the constitution which outlines the power of the council to authorize the organization of sections of any or all grades of membership, providing that bona-fide students of automobile engineering under 30 years of age may be enrolled as students and for the sum of $3 annually receive the S. A. E. Monthly Bulletin and be privileged to attend the meeting of the Society. To enter as a student, the endorsement of a member of the Society and the approval by the council is necessary. The object of the student enrollment, which is by no means a membership of any grade in the Society, is to foster the work of the Society in promoting the study of automobile engineering.

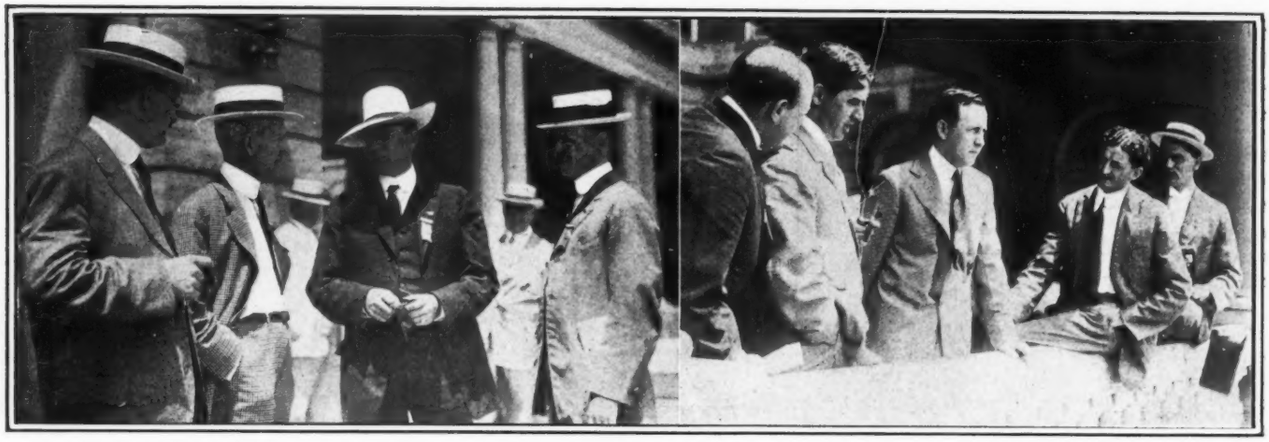
Next Meeting Place Considered

The question of the location of the next summer session of the Society was raised when Coker Clarkson read an invitation from the Panama-Pacific Exposition officials to hold the next summer meeting of the Society in San Francisco. This did not seem to strike a popular keynote, however, as it was felt that the value of the next meeting would be considerably lost through small attendance if the meeting were held on the Pacific coast. It was stated that the work of the Society is too valuable to have a single session lost in this manner, at this active period in the industry.

Ball game, Indianapolis section vs. the New Yorkers

An invitation from the Detroit Board of Commerce was also

Groups of engineers on veranda, left to right, Coker Clarkson, general manager of the society; Otis Friend, Mitchell-Lewis Co.; C. W. Hatch, Perfection Spring Co.; A. B. Browne; Herbert Chase, A. C. A.; H. C. Wilson



Left to right—John Demmler; Roger Griswold, Cutler-Hammer Co.; R. M. Owen, Entz Transmission; Charles Chevraux, Cleveland-Canton Spring Co.; F. E. Moscovics, Marmon Co.; David Beecroft; S. E. Jones; V. W. Kliesrath, Bosch Magneto Co.; R. H. Combs

Left to right—W. T. Norton, Jr., C. E. Clemens, Perfection Spring Co.; V. F. Lacy, James Cunningham Co.; Norman Bell

presented and while the hot weather would doubtless interfere with a meeting held in the actual city of Detroit during the month of June, it was felt by many of those present that the Detroit River would make an excellent starting point for a cruise among the thirty thousand Islands in the northern part of the Great Lakes, and the suggestion of chartering the City of Detroit III as a floating hotel seemed to meet with considerable favor. It was finally decided to secure the suggestions of different members and incorporate them in a circular letter to be voted upon by the voting members of the society.

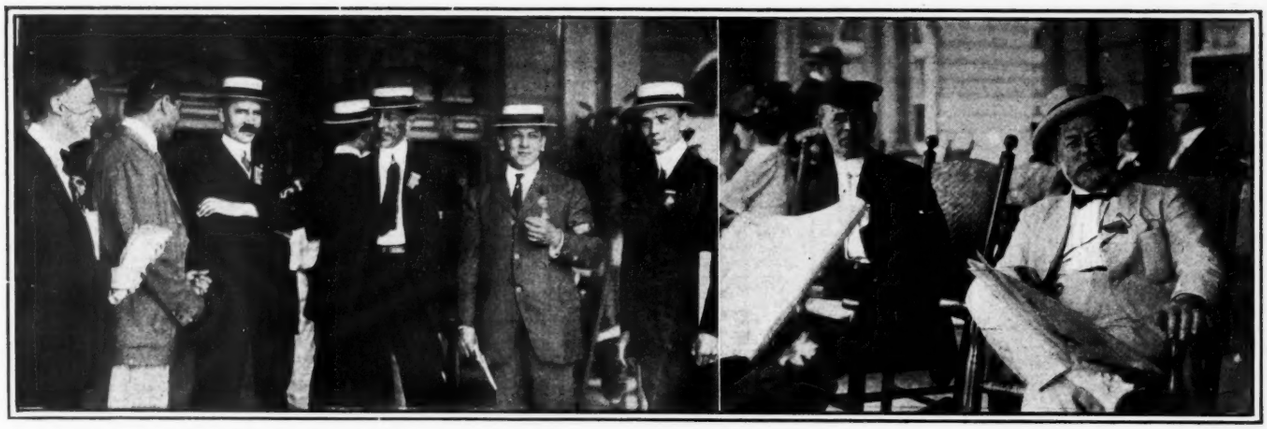
On Thursday evening the semi-annual banquet was held and this year it was graced by the presence of the ladies of the party. The banquet was tendered by the management of the hotel and was attended by all the members of the party. After the banquet, Orrel C. Parker gave a lecture on the coming European trip and by means of stereopticon slides and moving pictures toook his audience through the various countries to be visited by the Society of Automobile Engineers on their European trip, which starts next October.

Five reports submitted by the Standards Committee to the Society at large were accepted either in whole or in part. The report of the Iron and Steel division, presented by Henry Souther, chairman of this division, was accepted in toto. In discussing the report of the division, Mr. Souther called attention to the importance of its work, and stated that where manufacturers claimed that they did not make use of S.A.E. steels they really did use these steels in many instances without knowing it; that is, they used steel of the same composition and practically the same heat treatment. He went on to say that the number of steels is diminishing each year and for this reason it has been possible to cut the number of steel specifications practically in half. The report of the division permits an increased allowance of .005 in the phosphorus and sulphur contents. This has been done for commercial reasons and there does not seem to be any real proof that this means a lowering of the quality of the steels used in automobile manufacture. If a manufacturer needs a high quality steel he has but to specify it, and now that the more reasonable limit .045 phosphorus or sulphur has been adopted it may be expected that the steel maker will rigidly abide by it.

Papers Provoke Discussion

The papers on tires by E. R. Hall and J. E. Hale, experimental engineers for the Goodyear Tire and Rubber Co., on starting, lighting and ignition devices by A. D. Libby of

Winners of prizes. Left to right—J. Edward Schipper, THE AUTOMOBILE, all-around championship; S. L. Murfey, Grant Lees Gear Co., aquatic championship; Frank Martin, Stewart-Warner Co., fat men's race; R. H. Combs, Prest-O-Lite Co., bowling



Left to right—Herbert Chase, A. C. A.; J. E. Schipper, A. B. Browne. Joseph Anglada, Arthur Waterman. Right-hand photograph, Thomas Moore, Halcombe Steel Co.

the Splitdorf Co. and the Electric Transmission for Motor Cars by J. B. Entz of the White company, proved to be the prize discussion producers. These discussions, which are reported in part in this issue, showed the keen interest with which developments in the tire situation and in the gasoline-electric plant are followed. The discussion after Mr. Libby's paper entered a phase which seems to be uppermost in the minds of engineers of the present day, who are interested in the development of the electrical equipment of the automobile. This point is whether or not the 6-volt system or the 12-volt system is the better for all-around practicability on the automobile. The discussion did not show conclusively an advantage for either side.

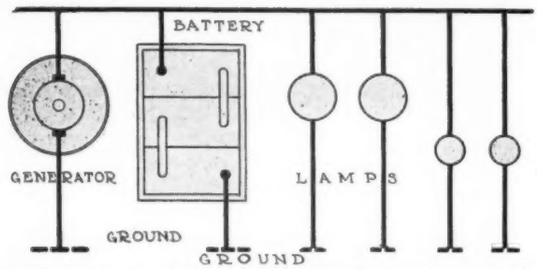
The report of the Electrical Equipment division was another which was accepted in part. This report embodied a standard insulation test and also the recommendation that the single wire system be adopted as preferred practice. No debate was occasioned on the subject of the insulation test and this part of the report was carried unanimously. When it came to the single-wire system, however, this proved to be one of the richest sources of debate of the meeting. The one-wire design was opposed by many because they deemed it to be unsafe and by others because they felt that the use of fuses was objectionable. Both these points were strongly opposed by those in favor of the single wire. The adherents of the single-wire system stated that the contention that the system is unsafe is absurd and that its successful use on 60 per cent. of the new models alone argued against this claim. They also held that the use of fuses was not an objection. The matter was finally automatically tabled because fifty voting members of the society were not present at the time.

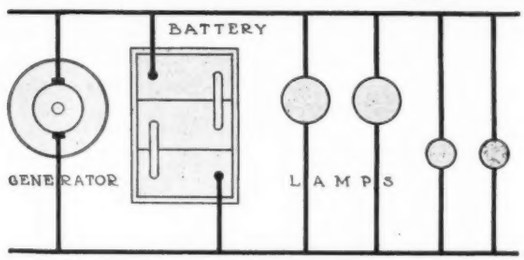
T. F. Harris, Twombly Motors; E. A. DeCampi, National Lead Co.; F. B. Pierson, National Lead Co.

Members of the Metropolitan section of the S. A. E. on hotel steps

The social side of the convention was an immense success. While the attendance was not so great as at some of the other summer meetings, the opportunity for a general good time was perhaps greater than ever before. That this was so was not a little due to the presence of the wives and families of many of the members. Bathing, tennis, golf and the hundred-and-one possibilities presented by the seaside environment were eagerly seized, in addition to the well-balanced programme of sports outlined by the entertainment committee. On Wednesday evening the sections of the Society entertained with original features of their own. The Metropolitan section produced a trial of a cyclecar driver, the Detroit section read a paper on a farcical ideal car and the Indiana section gave for the benefit of the members present a representation of an Indian trial in which other members of the Society were captured and tied to the stake in true Indian style.

Single-Wire Versus Two-Wire System





"The single-wire system with grounded return shall be recommended practice"—Report of the Electrical Equipment division of the Standards Committee.

Bijur—"Motor car manufacturers use the single-wire system because it uses less wire."

Libby—"System should not be adopted because it is not safe; a ground may mean a fire."

Conant—"Single-wire system should be adopted because it is in line with modern trend."

Moscovics—"The art has not as yet developed to a sufficient degree to recommend it."

Fergusson—"We have given up the two-wire system because we had trouble and use one wire."

Lloyd—"It will be easier to adopt this measure now than it will be a year from now."

Towle—"Strongest objection to the one-wire system is its lack of fire safety."

McMurtry—"The issue should not be delayed; heavy installations are using one wire."

THE fifth report of the Electrical Equipment division brought up the warm debate that was confidently expected on the respective merits of the one and two-wire systems. In spite of the lateness of the hour the question was argued pro and con and finally tabled after an undecisive vote, since there were not fifty voting members present. The report of the division follows:

1—All insulating material used in connection plugs, sockets and similar devices of electrical apparatus for use on gasoline automobiles shall be capable of withstanding for thirty minutes a temperature of 300 deg. F.

2—The single-wire system with grounded return shall be recommended practice.

The first part of the report of the Electrical division regarding the tests on insulation was passed without comment upon a motion by R. McA. Lloyd. The second part, however, on adopting the single-wire system as recommended practice proved the cause of the warmest debate of the session.

Three letters from Leonard Kebler, representing the Ward Leonard company; W. E. Winship, of the Titan Storage Battery company and the United States Lighting and Heating company, each protesting against the recommendation, were read.

The letter from the U. S. L. company follows:

"The Electrical Equipment division of the S. A. E. will submit the following for vote at the meeting on Thursday, June 25, at 2 p. m.

" 'The single-wire system with grounded return shall be recommended practice.'

"We believe it inadvisable for the S. A. E. to adopt such a recommendation at this time, and respectfully ask your consideration of the following arguments in favor of postponing action for at least 1 year.

"Advantages of the Grounded Return.

"First, Better contact and insulation in the lamp receptacle.

"Second, Fewer connections and simpler wiring.

"Advantages of the two-wire system.

"First, Not necessary to provide special returns for lamps carried on the body.

"Second, Short-circuit impossible if one ground occurs, or if two occur they must be on opposite sides of the line to form a short-circuit.

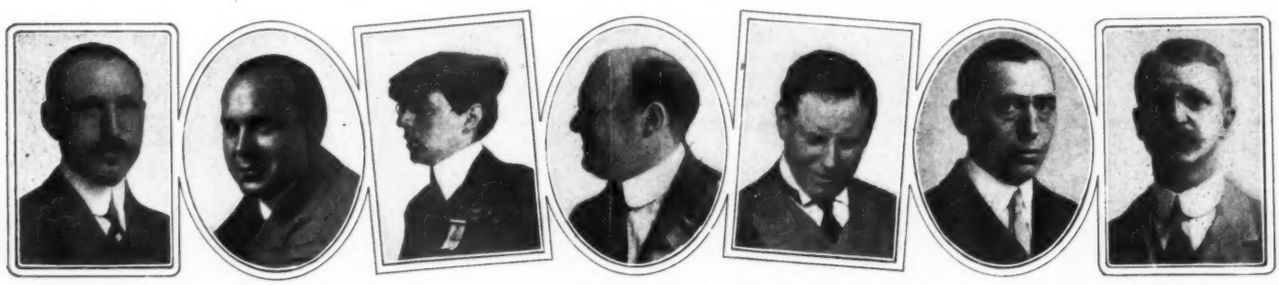
"Third, Circuits do not depend on lamps being tightly secured to the lamp brackets.

"Fourth, Circuits do not depend on the cleanliness of the metal frame where the ground is made as on single wire systems.

"Before a standard is adopted it would be advisable for the society to further consider the trend of electrical equipment design.

F. E. Moscovics, of the Marmon company, stated that he wished to warn the S. A. E. against the too rapid adoption of a recommendation, especially one of such a serious nature as this, where such eminent authorities seemed to be divided in their opinions. He cited the case of the Bosch design, where in spite of the fact that in their one-wire system they intended to lay out their design without fuses they were compelled finally to fuse every circuit for safety's sake.

W. H. Conant stated that he regretted that A. L. Riker, the chairman of the division, was not present to throw the weight of his personality and arguments into the matter. He said in part: "This matter has been discussed and postponed now for 2 years. In the meanwhile the car makers are doing



Some of those who took a prominent part in the one and two-wire discussion: Joseph Bijur, Bijur Lighting company; Leonard Kebler, Ward Leonard company; W. H. Conant, Gould Storage Battery company; F. E. Moscovics, Nordyke & Marmon; David Fergusson, Pierce-Arrow; A. L. McMurtry, consulting engineer; R. McA. Lloyd, consulting engineer

as they please and adopting rapidly the one-wire system. After consideration of the subject the Electrical division had decided that the adoption of this system would be the starting points of much better electrical practice."

Herbert Towle said: "The question seems to me of two-fold importance. First, the strongest objection to the one-wire system is in its lack of safety. Any ground causes a flash and in the presence of gasoline a flash means a fire. Secondly, a sound, durable condition of insulation must exist. Automobile manufacturers are careless in wiring, etc., and are not giving the electrical equipment a chance to show itself to its best advantage."

Mr. Moscovics stated his opinion that the art had not progressed far enough to settle a question of this nature as yet or to assert that one practice is better than another. Mr. Conant retorted that this argument could have been used at the time of adoption of practically every standard. He stated that Mr. Riker was at one time an advocate of the two-wire system, but was convinced the single-wire was better.

Mr. Moscovics stated that the only difference in Mr. Conant's ideas and his own was that he believed the art had not progressed far enough to adopt the recommendation. R. McA. Lloyd stated that he believed it would be easier now than a year hence. He stated that 60 or 70 per cent. of the cars now being built have the single-wire system. E. H. Ehrman, of the Chicago Screw Co., moved that a vote be taken on the matter, and after Joseph Bijur, of the Bijur Lighting company, had stated himself as being against the adoption of the system, Mr. Lloyd asked him why he had voted for it in committee. Mr. Bijur stated that he had never expressed himself as being in favor of the recommendation, but had merely remained silent after seeing the hopelessness of winning over those who wanted it. He said that the fire risk with the single-wire system was not twice as great but 500 times as great and that he believed the underwriters would stop us if the single-wire system were adopted. Mr. Bijur said: "Motor car manufacturers do not use the single-wire system because they like it better but because it uses less wire."

Albion D. Libby, of the Splitdorf company, cited the case of a $3,500 car which recently had caught fire through a short circuit and on which disaster had been prevented only by a quick removal of a battery lead by an expert who happened to be near. He stated it as his belief that the S. A. E. should not recommend the practice merely because "manufacturers who are turning out cars like sausages are using the single-wire system."

Mr. Conant stated that since there were not many in the room and the hour was getting late the vote be held over. Herbert Towle asked, "Why not hold over another year?" Mr. McMurtry stated that it was his belief that the issue should not be delayed, and cited the fact that the General Electric Co. built their high-voltage cars on the one-wire system. To this Mr. Moscovics rejoined that they were driven by experts.

David Fergusson, chief engineer of the Pierce-Arrow company, said that they had shifted to the one-wire system because of trouble with the two-wire system in getting good lamps and fittings.

A vote was then taken and the motion to pass the recommendation was lost. Mr. Conant protested that fifty voting members were not present.

6-Volt System vs. 12-Volt System

ALBION D. LIBBY'S paper on the new Splitdorf electric lighting, starting and ignition system provoked a debate on the merits of the 12-volt system.

W. H. Conant, of the Gould Storage Battery company, stated that he was in accord with the trend toward the 12-volt system. The reason he assigned to that tendency was the increase in efficiency of the 12-volt motors. He went on to say:

"Mr. Libby mentions the size of the plates, stating that they should be of sufficient size to meet the requirements of power, but I would like to emphasize that cognizance must be taken of the quantity and quality of the electrolyte. I further believe that it is not good practice to put the head and side lamps in series. The headlights have a tendency to flicker and if one is in trouble both go out. Concerning the use of fuses I believe it to be desirable but question if it is practical. Fuses are peculiar things, as I am well aware from knowledge of experiments on fuses which have covered years. It is hard to say, however, what they will do, even if they are only limited as closely as mentioned in the paper. Assuming that we have a fuse and it is blown, it means that the circuit is overtaxed, that something is the matter with the motor which makes it hard to crank. The owner or driver of the car will have to search for the trouble, and he is sure to close his circuit with a pair of pliers or a piece of copper wire or some other means.

"In fact," continued Mr. Conant, "I even suspect that some of you gentlemen have bits of copper in the basements of your houses which are doing the work that fuses should do. I agree with the author of the paper that an ammeter should be used and am convinced that the driver of today takes a delight in informing himself on the mechanical and electrical devices on his car."

Albion D. Libby, patent attorney for the Splitdorf Electrical Co., whose paper on electrical equipment started the discussion on 12 volts versus 6 volts

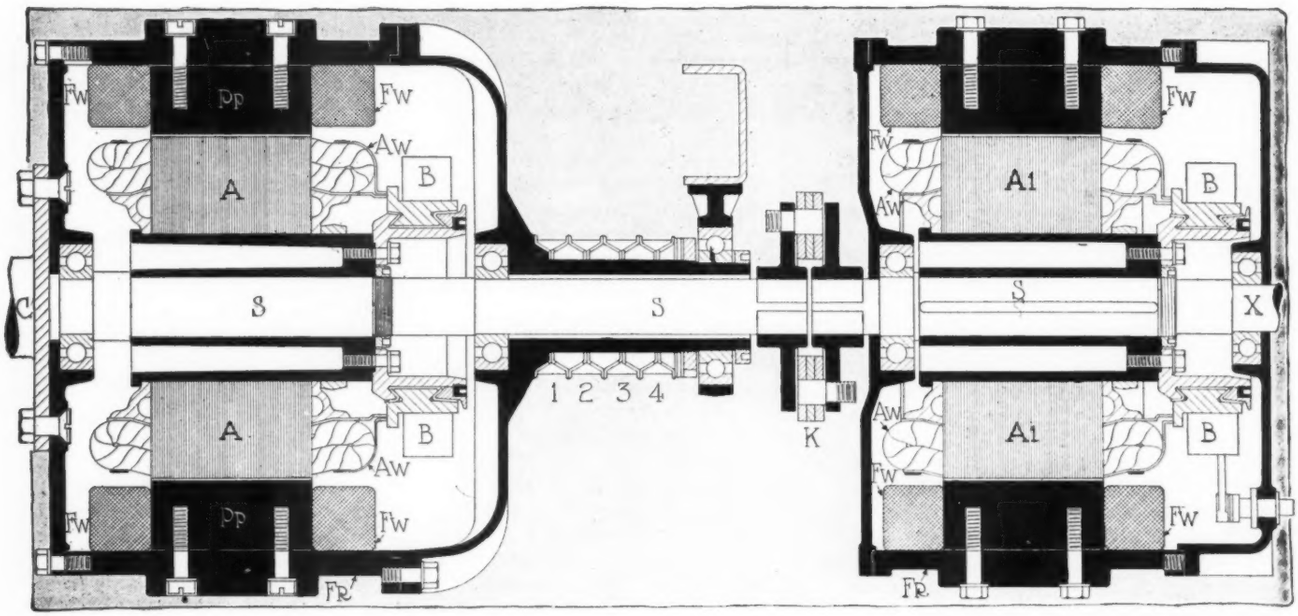
Mr. Libby illustrated the light weight of the present-day starting motor by citing an installation of a 22-pound motor on the Winton car he had driven down to Cape May. He said he wanted the lamp builders to build lamps of higher voltages and that he believed that the 14-volt lamp focussed as well as the 7-volt type.

Mr. Lloyd said he differed with Mr. Libby and favored the 6-volt lamp on account of its better focussing ability and stronger filament. Mr. Moscovics mentioned the latest Bosch 12-volt lamp and illustrated its filament, asserting that it had excellent focal ability. Mr. Libby said he was an optimist on the lamp situation and pointed to the example of the 6-volt lamp which at one time consumed 4 watts to the candlepower but now was rated at 1 watt per candlepower.

Mr. Bijur said that he was not committed beyond reason to the 6-volt system, but that he had seven arguments in its favor. These are as follows:

Less battery weight, stronger filament, only three cells, better focus, stronger portable lamps, less space for insulation, punch of 6-volt motor as good.

Electric Transmissions for Motor Cars



IN the Entz system of electrical transmission, the patents for which are owned by R. M. Owen & Co., New York City, a generator and a motor are used in an unusual way. The casing of the generator FR, which carries the fields or pole pieces PP, is bolted directly to the crankshaft and thus replaces the flywheel; the armatures, A and A1, of the two machines are coupled together at K and their shaft S is permanently fastened to the drive shaft at X at the rear. The fields of the motor are stationary, being supported by the frame.

The speed of the car is regulated by the throttle and the torque for different loads is varied by changing the field strength of the generator and on lower speeds, by sending the generated current to the motor. When the car is running along the level, at which time a mechanically driven car would be on high gear, the generator winding Aw is short-circuited on itself and therefore with a very slight amount of slippage between the field and the armature, a heavy current is generated, this current being of sufficient strength so that the magnetic attraction between field and armature is equal to the torque required to propel the car at that speed. The slippage varies directly with the torque required, so that if a slight grade is encountered, the slippage will become slightly greater; this will increase the voltage of the generator and then the current will increase, which will produce a stronger magnetic attraction for the armature on the field, and thus the torque will become greater. On high gear the slippage might be, for example, 40 revolutions per minute when the engine is making 1,000 revolutions.

On lower speeds, and there are seven, the increase in torque on the drive shaft is obtained by weakening the fields of the generator and also by sending the current generated into the motor. When a very steep hill is encountered, the torque between generator field and armature will be greater than the engine is capable of producing if the field is not weakened or the current pumped into the motor, and thus the engine would slow down. But when the field is weakened, the motor must rotate just so much faster to produce the maximum pulling force between the field and the armature of the generator. This means a large increase in the slippage and thus a large current will be generated and pumped to the motor where it will aid in pulling the car up the hill.

Digest and Discussion of Paper by Justus B. Entz

ELECTRIC transmission systems as applied to motor cars are constituted of methods of electrically controlling the transmission of the power of the engine to the wheels. It is necessary not only to control and transmit the power but to do so at varying speed and torque ratios while developing the full power of the gasoline engine.

One method of electric transmission consists of a dynamo or electric generator driven by the engine and supplying electric energy to one or more motors connected with the driving wheels.

Another method consists of a dynamo-electric machine connected with or mounted on the driving-shaft and adapted to assist the engine at times of heavy load, drawing its energy from a storage battery, and in turn charging at times of light load, becoming automatically a generator for that purpose and utilizing the surplus power of the engine.

Justus B. Entz

The third system is known as the Entz electric transmission and consists of a dynamo-electric machine, one member of which, the field magnet, is connected to the engine crankshaft and takes the place of the flywheel, the armature being connected with the driving-shaft. This unit serves to transmit the turning effort of the engine to the driving-shaft by means of current established in its circuit, due to a speed difference between its members on what constitutes the high speed of the electric transmission.

This clutch-generator of the electric transmission constitutes a very elastic clutching and transmitting means, but is not by itself capable of transmitting more than the torque of the engine. For higher torque upon the driving-shaft, use is made of an electric motor whose armature is mounted upon the driving-shaft and which receives current from the first machine or clutch-generator. Thus on speed posi-

tions below the highest the motor is included in the circuit of the clutch-generator. If the windings of the two machines be the same, and the same current passing through each, the torque represented by that current which will be the same in each, and the electromotive-force will be the same in each for the same speed-difference between armature and field.

Thus if the full torque of the engine were transmitted for a slip or speed-difference between armature and field of the clutch-generator of 75 revolutions per minute and the motor with the same electrical resistance were included in the circuit, the slip loss would be increased to 150; if the engine were running at 1500 revolutions per minute the speed representing useful power would be 1350 revolutions per minute at engine torque; but the torque on the driving-shaft will have been doubled because of the motor, and a C.E.M.F. all will have been set up in the motor, which must be overcome by the clutch-generator, which results in a speed of 675 of the driving-shaft and a torque double that of the engine, the clutch-generator then having a slip of 825, 150 being due to the resistance of the clutch-generator and motor and 675 to overcoming the C.E.M.F. of the motor, the latter representing useful work in the return it gives to the driving-shaft in additional torque. Gradations of control in speed and torque are secured by means of varying the field strength of the clutch-generator and motor, as will be shown later on.

We will now consider the electric transmission of the engine power to the wheels and make a comparison between a generator-motor system, wherein the generator converts all of the power of the engine into electric energy and supplies it to the motor, and the Entz electric transmission system wherein the generator acts also as a clutch and converts only part of the engine power into electric energy, and only when in the lower speeds.

Inspecting Owen car with Entz transmission. From left to right, C. W. Hatch, R. M. Owen, J. B. Entz, H. C. Wilson

The electric energy equal to the maximum horsepower of 42 1-2 at 1,500 revolutions per minute is 31,700 watts. We will consider that the same electrical units are used in each of the two above-mentioned systems. We will call the current which represents the full output of the generator at full field strength 100 per cent. We will call the C^2R loss at this current 2 1-2 per cent. of the total input, for each armature and each field winding, and the core losses for full field strength and full speed difference 5 per cent. in each armature. The first losses vary as the square of the current and the core losses nearly as the square of the voltage, or the product of the field strength and speed, to which the voltage is equal.

In the generator-motor system with 100 per cent. current we have 2 1-2 per cent. C^2R loss in each armature and field winding or 5 per cent. in generator and 5 per cent. in motor, a total of 10 per cent., which appears as a speed loss as it lowers the effective voltage by that amount, so that the vehicle speed is reduced from 50 miles per hour, corresponding to 1,500 revolutions per minute of the engine, to 45 miles per hour. There is also 5 per cent. core loss in each armature or 10 per cent. total, corresponding to a reduction in tractive effort from 6.9 to 6.2 per cent. The total efficiency is 80 per cent.

Full Torque Transmitted

In the electric transmission system the full torque of the engine is transmitted by the generator unit alone, short-circuited upon itself, and with no torque loss.

To get double the torque with the electric transmission it is not necessary to increase the current, but the motor is included in the circuit of the clutch-generator and its torque added to that of the engine as transmitted by the clutch-generator and the latter slips a little more than one-half engine-speed to supply the necessary voltage for the motor.

To get three times torque with the generator-motor system we will figure on 300 per cent. current and 3 1-2 times torque of 100 per cent. current.

To get three times torque with electric transmission we must double the current through the motor and reduce the field strength of the clutch-generator to one-half so that it can deliver double current.

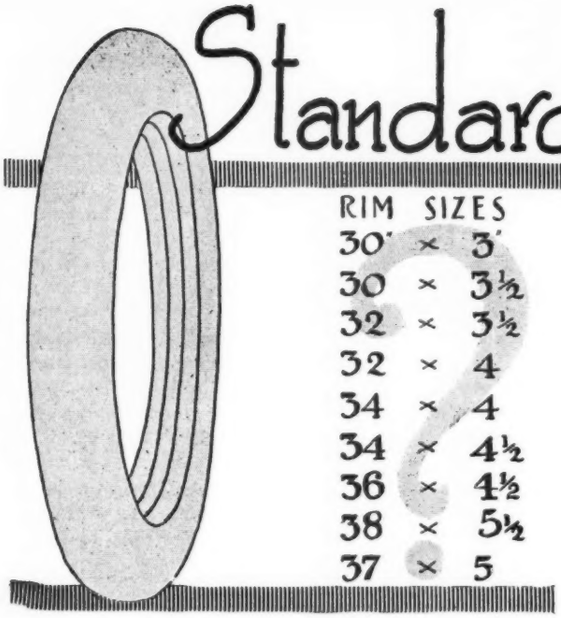
Herbert Chase Opens Discussion

Herbert Chase opened the discussion on this paper by asking if the curves shown were founded on practice. To this Mr. Entz replied that the curves were the results of dynamometer tests. He further stated that with this system the gear reductions do not vary and that in slipping the clutch you secured the same effect as with the ordinary type of drive. A. L. Moscovics, of the Marmon company, asked if Mr. Entz had any data on the amount of weight saved by the use of the electric transmission. Mr. Entz replied that so many of the parts of the car were replaced that there was no resulting weight increase of importance. Mr. Chase asked if the weight could not be further reduced by the use of a light-weight high-speed motor. Mr. Entz stated that he thought this would be feasible by using a greater reduction in the transmission and also that it must be remembered that the weight of the electric starter is included in the plant.

R. McA. Lloyd, a consulting engineer of New York, stated that in his belief people were not satisfied with merely the transmission of torque, but that they want an actual transmission of horsepower. That is to say, they want the capacity to get the power to the wheels, and while it is comparatively simple to get torque a large motor generator is necessary in getting power. He said, also, that it is impossible to state that there is no loss of power through the transmission. Mr. Entz agreed with him, saying that it is not true that there is no loss in the transmission, but that

(*Continued on page* 13)

Standardizing Tire Sizes



Society Aims to Reduce Tire Sizes from Fifty to Nine—Important Papers and Discussions—Rim Test Determined

THE tire work of the Society was divided under two heads, standardization and educational. The standards work was incorporated in the reports of the Pleasure Car Wheels division and the educational work in papers presented by E. R. Hall, C. C. Carlton and J. E. Hale.

When brought before the Society, the report of the Pleasure Car Wheels division was offered by its chairman, Henry Souther, as a progress report with the exception of that part which refers to the method of rim inspection, this being in such from that approval was thought advisable. The only other subdivision is that offering eight sizes of tires as recommended sizes. These eight sizes will take in 85 per cent. of the demand, the oversizes comprising a good part of the remaining 15 per cent.

The main features of this report follow:

James E. Hale, Experimental Engineer of the Goodyear Tire & Rubber Co., who is actively interested in tire standardization

Routine Test of Rims

It is the opinion of the Pleasure Car Wheels division that the test of bursting strength or to destruction is not the best routine test to be used in connection with the inspection of rims for pneumatic tires. It is the opinion of the division that a pressure test with predetermined deflection under predetermined pressure is a good routine test; the test to be made with water pressure.

The measurement of deflection of a clincher rim should be made across the outside of the clinches.

The deflection of a straight-side rim should be measured across the edges of the straight sides.

Tire Sizes Determined

In recommending a decreased number of tire sizes the division considered the needs of the different weights of cars and fixed upon a sufficient number to take care of the weights of the entire range of cars and at the same time permit the engineer sufficient choice to allow him to provide a satisfactory factor in taking care of different car loads.

Eight tire sizes which the division decided to recommend are shown in the following table:

RIM SIZES	TIRE SIZES	TIRE SEAT DIAMETER
30x3	30x3	24"
30x3½	30x3½	23"
32x3½	32x3½	25"
32x4	32x4	24"
34x4	34x4	26"
34x4½	34x4½	25"
36x4½	36x4½	27"
38x5½	38x5½	27"

This table, it will be noted, involves only eight rim sizes, and five tire seat diameters. One or two other regular tire sizes are under consideration by the division.

It was thought by the division that tire oversizes should not be recommended for regular equipment.

In speaking of the report, Mr. Souther pointed out that the deflections given are the results of a great many tests, and that no attempt at enforcement of the recommendations would be made before next January, in order to give the manufacturers time to prepare for them. Standard demountable rims are not ready for report, the division feeling that it needs more light on the subject and more investigation before anything concrete is offered the Society.

A good point was made by O. A. Parker when he said that the standard rims would be economical to maker and user alike to utilize well-balanced tires. If they are too large in section, they are out of proportion and hence not serviceable.

Fergusson Wants 37 by 5 Standard

David Fergusson thought that the 37 by 5 size should be added to the list of standard sizes. It is now regarded as an oversize, but it is used by a large number and has been found to be a very good proportion.

E. R. Hall explained that it was the intent to have all the tire sizes even, and that the standardization should cause all manufacturers to use even sizes, whereas the manufacturer who puts a 37 by 5 on a 36 by 4 1-2 rim gives no chance for the oversize idea, except that the purchaser would then regard the 38 by 5 1-2 as the oversize. This is somewhat out of balance, however.

Henry Hess has run a car equipped with 37 by 5 tires for

months on the original air and finds that size very useful, strengthening Mr. Fergusson's remarks. He made the point that by having oversizes, the report suggests that the user pay extra, and he could not see the reason for having a well-proportioned size such as this 37 by 5 made anything but standard.

Mr. Souther agreed that this extra charge point was logical, but pointed out that no matter what size tires are on the car, some customers always want something a little larger. If the car be equipped with 37 by 5 tires, some would want 38 by 5 1-2 sizes.

Mr. Fergusson objected to the 36 by 5 as being a size which is not known, but Mr. Hall stated that this size has had considerable testing and is found to be better than the 36 by 4 1-2 or the 37 by 5, due to better balance that may be thus secured.

E. R. Hall, Experimental Engineer of the Goodyear company, who is active in tire standardization

Mr. Souther said the division was glad to get the suggestions, and explained that even if several more sizes had to be added to the eight proposed as standard, it would not be a serious matter. There are at present from 48 to 51 sizes which have to be furnished by the tire people, and the drop to eight or ten is a big one indeed. He deprecated the unfortunate use of very large oversize tires on narrow rims, likening this practice to the big soap bubble which wobbles on a pipe. It is the same with the big section tire which rolls on the narrow rim against the side rings and tends to rim cutting and flexing of the bead.

Three Educational Tire Papers

Three papers, which will prove of great assistance to the Pleasure Car Wheels division, were given the society at this meeting, occupying a good share of one of the morning sessions. These dealt with the standardization of rims and felloe bands and were the results of exhaustive research and experimental work by E. R. Hall, experimental engineer with the Goodyear Tire and Rubber Co., and C. C. Carlton of the Firestone Tire and Rubber Co. Two of these papers were by Mr. Hall, one being a criticism of the standard rims adopted by the Society of Motor Manufacturers and Traders of Great Britain, and the other dealing with suggestions for the standardization of pneumatic tire rims. Mr. Carlton discussed the possibilities and difficulties of formulating acceptable recommendations for one standard felloe band for wheels to be equipped with pneumatic tires.

The British Standardized millimeter clincher rim was decided upon in June, 1913, and tolerances were adopted in September, 1913. These are open to criticism from the American viewpoint, and Mr. Hall explained why. The main features of this paper follow:

Ever since the clincher type automobile rim has become popular in Great Britain and Europe a chaotic condition has existed in millimeter rim design. Each manufacturer of millimeter rims had his own so-called standard design to which he worked and the result was that rims marked the same size and supposed to take the same tire differed widely in design. The tolerances which the rim manufacturers allowed themselves were so gross that there was oftentimes considerable variation between two rims of the same size and manufactured by the same manufacturer. This condition prevailed in spite of the fact that it is ruinous to a beaded edge or clincher type tire, such as is in general use abroad, to be used on a rim which it does not fit exactly. A great hardship was thereby worked upon the tire manufacturers who had to make the bead of their tire small enough to slide into the smallest rim of its rated size on the market, and to trust to luck for satisfaction in their product when used on the larger rims of its rated size.

The Society of Motor Manufacturers and Traders of Great Britain in June, 1913, standardized the millimeter clincher rim and later, in September, 1913, adopted a set of permissible tolerances to which the rim manufacturer should work. The society has produced a most complete set of rim checking templates, tapes and printed specifications covering its standard.

As far as we are able to determine, this standard, known as the S. M. M. T. standard, has been universally adopted abroad.

Although a very great step in the right direction and possibly the best that could be made at this time, the S. M. M. T. standard is open to criticism from the American viewpoint.

Two Chief Dimensions

It will be noted that the two chief dimensions of the rim section are the width between clinches and the depth of clinch and that the majority of the other section dimensions can be expressed in terms of these two. As a matter of convenience and record this feature is admirable. The width of the rim was apparently chosen arbitrarily, as it does not increase in increments corresponding to the increase in rated rim size. Between any two of the first six sections the increase in rated size of rim and tire section is exactly 15 millimeters, while the corresponding increases in width are respectively as follows: 13.0, 11.0, 5.0, 9.5 and 13.5 millimeters. The increase in rated size between the 150 and 175-millimeter rim is 25 millimeters, while there is no increase in width. We would have preferred to have this increase a constant quantity, possibly 10 millimeters, between any two consecutive sizes from 75 millimeters to 150 millimeters, inclusive, and the increase between the 150 millimeter and 175 millimeter sizes to be the same as at present. This would certainly give a more uniform and logical step-up in tire sectional

Group of those who entered tire discussion: Left to right, E. R. Hall, Cornelius T. Myers, mechanical engineer; W. H. Roberts, assistant engineer of the department of finance, New York City, and James E. Hale

sizes, provided the tires were made anywhere near rated size.

The depth of clinch increases by very small increments as the rim size increases, not more than 2 millimeters in any case. As these differences are so small, and in view of the fact that the tolerances prescribed permit them to entirely disappear and in some cases overlap (as will be noted below), we would prefer to see dimension *V* equal 13 millimeters for both 90- and 105-millimeter rims and 16 millimeters for 120- and 135-millimeter rims. This would give only four different inside rim contours instead of six as at present prescribed, making it necessary for the rim manufacturer to have only four sets of contour rolls instead of six, thus cutting down the forming roll equipment 33 per cent. Under these conditions the rims should fit the tires exactly as satisfactorily as in the case of the present standard.

The American Viewpoint

The above criticisms and suggestions are entirely from the American viewpoint. We must admit that the S. M. M. T. standard as it stands is a very great improvement over former conditions, and is probably the very best that could be attained under the circumstances. Credit is due the Society of Motor Manufacturers and Traders for causing the adoption of an admirable rim section contour comprising excellent proportions, bearing the same relation to each other in all sizes. In this particular their standard is certainly better than the American standard.

It is improbable that any of the improvements to the S. M. M. T. standard suggested above could be incorporated at this time. For this reason we favor its universal adoption in its present form, excepting tolerances.

The tolerances specified by the S. M. M. T. standard are so great that they almost entirely defeat its purpose from the American standpoint. Accustomed to rims manufactured with a very high degree of precision and to very close tolerances, the American tire manufacturer designs his tire to give an ideal fit on a rim exact to standard and he is sure the tire will fit practically as perfectly in a maximum or minimum rim of its size. If a tire is made to fit a correct S. M. M. T. standard rim as perfectly, the tire cannot be made to enter a minimum rim and will float around and be a very poor fit in a maximum rim.

Very helpful data and valuable suggested standard rims for pneumatic tires are given in Mr. Hall's other paper. There are six representative groups of rims manufactured today, and from each a typical rim, which combines all the attractive and as few of the unattractive features of the rims of its group as possible, is picked out. This applies to all except the demountable rims, in which case only the selection of the felloe bands was made, leaving the type of top rim optional.

C. C. Carlton in his paper on standard pneumatic felloe band recommendations pointed out that there is no part of the motor car in which there are more varieties and at the same time more possibility of standardization. He makes plain the feasibility of standardization of the wood felloes for the three types of rims, namely, the demountable, detachable and the clincher. His remarks follow:

The Pleasure Car Wheels division of the Standards Committee, of the Society of Automobile Engineers, was created to study various types of pleasure car wheels with particular attention to diameters, to various types of steel felloe bands and to the various methods of carrying pneumatic tires thereon. From this standpoint, pleasure car wheels can be divided into three classes, namely, those equipped with a one-piece regular clincher rim; second, those equipped with quick detachable rims requiring no steel felloe, and third, those equipped with a steel felloe band upon which is mounted a demountable rim.

We believe we are safe in saying that there is no part of the automobile in which there is more variation and at the same time, in which there is so great a possibilitiy of standardization as the wheel. The types of tire carrying rims being manufactured number about fifty, while the types in general use actually run over twenty.

One-Piece Regular Clincher Rim

The most simple form of an automobile wheel is the first above mentioned, namely, that carrying a regular clincher rim. The rim is practically standardized at the present time, the only variation possible being in the thickness of the steel from which the rim is manufactured. This variation is so slight that for all practical purposes the wood wheel may be considered already standardized.

Quick Detachable Rims

The quick detachable rim, whether for clincher or straight side tires, varies only in the thickness of the steel itself, and in the method for detaching the tire. For all practical purposes it may be said that the wood wheel on which quick detachable rims are used, is already standardized, the only variation now being the thickness of the steel section. The only further step that can be made in the standardization of the wheel carrying a quick detachable rim is to standardize the device for detaching the tire, and there are so many greater problems presenting themselves, that it seems well to forego any further action along this line, for the present at least, especially in view of the fact that the quick detachable rim has been practically displaced by the demountable.

Two Distinct Classes of Demountable Rims

As already said, the consideration of the adoption of a standard wood wheel dimension for all demountable rims, presents at once the type of steel felloe, which in turn is governed, first by the device by which the tire carrying rim is fastened, and second, by the very nature of the rim base itself. Practically all of the demountable rims in common use, in fact, considerably over 90 per cent. of the demountable rims purchased by the car manufacturers today, can be divided into two classes: First, the so-called local wedge type rim which is seated upon a felloe band manufactured from straight bar steel, by merely being flanged up in some form at the back side; the bearing at the front being secured by a type of local wedge which is forced flat against the steel felloe on the one side and upon which the tire carrying rim rests on the other.

The second class of rim above mentioned is equipped with two beads on the underside of the rim base. The rim in this class are for the most part quick detachable as well as demountable. The felloe band itself must be a hot rolled section with a flange or bevel upon the back side upon which the bead of the rim rests. Whether this rim be for straight side, clincher tires or universal, is immaterial as far as the present discussion is concerned.

This type of rim depends for its fastening device either upon a continuous wedging ring or upon a local wedge which has a similar bearing. This type is in use by a very great majority of American cars selling at $1,500 or above.

The members of the Pleasure Car Wheels division, who have spent much time at the study of this problem, will admit, we believe, that it will be a comparatively simple matter to adopt a set of wheel dimensions and a set of steel felloe bands, to which could be adapted with only slight changes, considerably more than 90 per cent. of all the rims of this type in common use. This would be a step forward, but to have adopted two S. A. E. standard truck felloe bands, we will all admit now would have been a mistake.

Universal Standard—The Acme

Mr. Wall, in opening the discussion, agreed with Mr. Hall that the Acme is some day to have a universal standard for rims. The time will come when we will be as interested in

this work as we are at present in the American standards.

Mr. Carlton agreed with everything Mr. Hall said and suggested writing to the S. M. M. T., telling that organization of the objections of the Americans to these low tolerances.

Mr. Hall pointed out that he has advocated two types of felloes in his paper, while Mr. Carlton seeks to standardize one alone. This, of course, is very desirable, but Mr. Hall thinks it almost too much of an undertaking to come at once, two being hard enough to consider.

Further backing up his argument against the introduction of a 36 by 5 tire, Mr. Fergusson explained that it means another size of felloe band, whereas the 37 by 5, the 36 by 4 1-2 and the 38 by 5 1-2 take the same band—additional support for the 37 by 5.

Truck Tire Situation an Important Element

Easily a feature of the meeting was the paper by J. E. Hale of the Goodyear company, entitled "A General Summary of the Truck Tire Situation." This gives a synopsis of the whole solid tire matter and shows that the situation is really quite complex. The paper is one of the best expositions of the condition of affairs which has been compiled and indicates a great deal of research work by its author.

The question is largely a matter of how best to compromise between the hard tire and the more resilient type. The very hard rubber tire is longer lived, but, on the other hand, it gives the mechanism of the truck more vibration, whereas the softer type which is best in this latter respect has a shorter life. The great need is for a better interchange of compositions among the tire people and the giving by the manufacturers of better tires in the opinion of truck men.

The Hale paper, which appeared in the May Bulletin of the society, is given in part:

The Truck Standards division in its efforts to arrive at a universal schedule of solid tire carrying capacities satisfactory to all concerned, discovered that the situation is really quite complex and decided therefore that a synopsis of the solid tire situation as a whole might be worth while. As an introduction let me state that there is almost no opportunity to resort to theories and exact formulae in solid tire design, a fact which will be readily appreciated after consideration of the discussion which follows; experience and judgment being by far the chief requisites for producing results. It is fair to add, however, that the application of good engineering practice and methods can reasonably by expected to produce better results than could be obtained from the hit-or-miss attention of salesmen and factory workmen. It is unfortunate that the art has not progressed sufficiently to permit the presentation of data and facts which can be considered at all complete or satisfying. However, even though the absence of theories and data is so regrettable I hope, since the truck tire problem is so intimately connected with the truck industry, to find that the following remarks will prove of interest, and especially that they may serve as a basis of starting something for the betterment of the situation.

Taken in a broad sense undoubtedly economy of truck operation is the real issue. It follows therefore that if an "economical tire" could be evolved an ideal solution would be at hand.

Solid tires in service under certain operating conditions give certain results in the performance of their functions. These results are dependent on the tires themselves and on the conditions under which the tires are used.

Mr. Hale stated that there is no doubt that a large proportion of the energy of the motor is consumed in internal friction in the tire itself and that it therefore follows that there would be a saving in gasoline if there were not so much energy consumed in the tire. These conclusions are founded upon experiments.

Electric Transmissions for Motor Cars

(*Continued from page* 9)

at high speed the loss does not exceed 5 per cent. of the power of the engine. Because the torque is transmitted directly there is but small loss. The principle is the same as in the electric dynamometer, the difference in speed between the two members of the dynanometer causing the only loss.

Mr. Lloyd inquired if there was no loss of energy in keeping the magnets excited. To this Mr. Entz exclaimed: "Yes, that is where the loss occurs because that means the difference in speed between the dynamometer elements." He further stated that there is also a core loss and an eddy current loss as shown in the tabulations given in the paper. In response to question as to external resistance used in control Mr. Entz replied that this was only used in employing the dynamometer as a brake. The shunts to the motor field are not external, being contained within the controller unit. He stated his belief that as a manufacturing proposition the electric transmission would be cheaper than the mechanical, because the testing and assembly work are much simplified. The circuit is always closed.

Can Run Steadily at Full Load

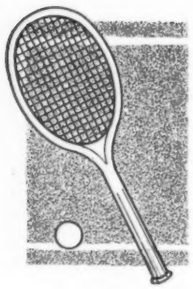
John Heinze, chief engineer of the Northway Motor Co., asked how long the electric transmission would last if it were run continuously at full load. To this Mr. Entz replied that it would be forever. To Mr. Heinze's inquiry as to the rise in temperature, Mr. Entz stated that the apparatus would never become so warm that the hand could not be placed on the brushes or coils. He further stated that when run as a clutch there are no core losses at all. As first constructed the armature shaft was non-continuous, but now it is manufactured in one piece.

Mr. Heinze asked what would happen if a 50-horsepower machine were taken to the Indianapolis speedway to be run at high speed; what would the weight of the magnetic parts be. Mr. Entz stated that the armatures would weigh 100 pounds each. Mr. Heinze expressed his conviction that with the transmission of so much power through such small units there must be a marked temperature rise, but Mr. Entz said that as far as the temperature was concerned the plant would stand the full horsepower. Bruce Ford, of the Electric Storage Battery company, Philadelphia, asked if the power would be proportional to the slip in the 50-horsepower engine. Mr. Entz replied that the full torque of the instrument is transmitted to the rear wheels and to a further inquiry from Mr. Heinze Mr. Entz stated that if the motor developed 50 horsepower then 48.5 would be delivered to the propeller shaft.

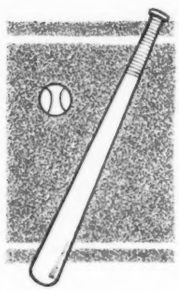
High Efficiency Obtained

Mr. Entz stated that the elimination of the losses in the instrument permits one to work at high efficiency with a wide open throttle, and that in ordinary work it is similar to any clutch where it can be worked at a slip and still transmit torque to the rear wheels. Mr. Heinze then stated his belief that in all ordinary work the electric transmission is perfectly satisfactory.

A general debate ensued for a time on the possibilities of transmitting such a large amount of power through such a comparatively small and light unit. To clarify the situation, Herbert Towle explained that it must be remembered that the generator developed only 5 per cent. of the energy imparted by the transmission and therefore for transmitting 50 horsepower it need only be a 2.5 horsepower electric machine. The only time that the machine will have to get rid of any amount of heat would be when the field lags behind the armature and therefore the heat is least when the slip is a minimum.



All Work and No Play Makes Jack a Dull Boy



ON Friday afternoon, on the sands where America's first Beach Races were held, after the business of the meeting had ceased to occupy the attention of the engineers, they turned themselves loose on the program of sports that had been arranged by Chairman F. E. Moscovics, of the Marmon company, who headed the sports committee. After the grand parade, in which was incorporated a contest for the most bizarre costume, the cortege broke up and assembled on the hard beach. Here, amid the clicking of moving picture machines and the snapping of camera shutters, the engineers disported themselves with a remarkable lack of dignity.

Conant Takes the Prize

Coker Clarkson, general manager of the S. A. E., in a modest baby blue Oliver Twist suit, gamboled about the beach without fear, surrounded on all sides by the tribe of Indiana section Indians in full war paint. But, best of all, was ballet dancer W. H. Conant, the erstwhile silver-tongued orator for the single-wire system in the warmest debate of the professional session. Dressed in a delicate pink lampshade ballet costume, with a mass of much-bleached blonde hair, he easily captured first honors.

In the baseball game, which was of the indoor variety, the Indians literally tied their Metropolitan rivals to the stake. The tenderfeet had no show, in spite of their brilliant playing, for, wherever the ball was batted, the huge form of an Indian in full war paint would loom up and with the easy grace of months of preparation for this contest, would put the Metropolitanite out. The final score was 12 for the Indians and 5 for the Metropolitans. The batteries for the winners were Berne Nadall, advisory engineer of the Stewart-Warner company, and E. L. Vail, of the Waltham Watch Company. For the Metropolitan section the twirling was done by Herbert Chase, laboratory engineer of the A. C. A., and the catching by D. J. Burns, of the Ward Leonard company.

Finish of the 100-yard dash by J. Edward Schipper, winner of the S.A.E. all-around athletic championship.

Waltham Watches for Athletics

The field contests were next held, the matches including a base running contest, shot put, hammer throw, 100-yard dash and a swimming race. The scoring was done on a point system, in which first place counted 5, second 3 and third 1. The contestant securing the greatest number of points was awarded the all-around championship trophy, a beautiful opera model gold watch donated by the Waltham Watch Company. Separate trophies were awarded for the base-running contest, and the aquatic championship, although points on these contests were included in the all-around championship. The tennis tournament, bowling and fat men's race were not counted in the all-around championship, but had trophies of their own. Alfred Reeves, general manager of the National Automobile Chamber of Commerce; John Wetmore, of *The Evening Mail*, and George W. Houk, of the Houk Mfg. Co., were in charge of the scoring.

The all-around athletic championship of the society was won by J. Edward Schipper, Engineering Editor of THE AUTOMOBILE, with thirteen points acquired by first place in the shot-putting and broad-jumping events, and second place in the base running. Second place was taken by S. L. Murfey, of the Grant Lees Gear company, a new applicant to the society, with 11 points gained by taking first place in the swimming and base-running matches and third in the 100-yard dash.

The 100-yard dash was won by D. R. Swinton, mechanical engineer for the Tuthill Spring company, of Chicago. In addition to capturing first place in the fat men's race, Frank Martin won the hammer throw.

A trophy cup was awarded to Mason P. Rumney, factory manager of the Detroit Steel Products company, and Miss Marion Bate, daughter of John Bate, of the Mitchell company, as first prize in the dancing contest. Second prize in dancing was awarded to Walter Allen, of the Bijur com-

Left—S. L. Murfey, winner of the swimming race and base running contest. Center—D. R. Swinton, winner of the 100-yard dash. Right—Frank Martin, winner of the fat men's race and hammer throw

pany, who danced with Miss Margaret Houk, daughter of George Houk, of the Houk Wire Wheel company. The bridge whist prize, a piece of tapestry, was won by Mrs. A. B. Browne, wife of Arthur B. Browne, consulting engineer, Branford, Ct.

The tennis tournament has not as yet been concluded. Herbert Chase has reached the finals by defeating Coker Clarkson. David Beecroft, Walter M. Nones, general manager of the Norma company, and J. E. Schipper are still in the tri-finals. As these men are all from New York, the match will be played off in that city.

The bowling trophy, a cup offered by the management of the Cape May hotel for the bowler making the highest score, went to R. H. Combs, engineer of the Prest-O-Lite company, who averaged 196 for six games, with 213 as his high score. P. D. Burns, of the Ward Leonard Electric Co., fought him to the finish, having a high score of 206.

Left—William Gray, an active participant in the beach sports. Center—One of the Indians throwing the hammer. Right—F. E. Moscovics, chairman of the Sports Committee

Histrionic Ability of Engineers

On Wednesday evening an entertainment program was provided by each of the three sections of the society. The Metropolitan (New York) section gave a mock trial, the Detroit section a paper on the ideal car and the Indiana (Indianapolis) section a trial at the stake by the Indians.

In the show given by the Metropolitan section the plot was a mock trial of the driver of a cyclecar who, while in a hilarious condition, had run between the wheels of a 5-ton brewery truck and wedged the shaft and done other serious damage to it. In the lap of the driver was a young cabaret singer who introduced valuable testimony in the case. The part of the singer was admirably rendered by Herbert Chase, who labored under the name of Miss Cyclecine Bloomerstripe. Others taking part were Joseph Anglada, as Judge Rumhauser; Orrel A. Parker, counsel for plaintiff; J. E. Schipper, counsel for defense; A. E. Potter, court officer; A. J. Poole, truck owner; Coker Clarkson, truck driver; Louis Marburg, fixed post cop; Frank Trabold, motorcycle policeman; A. B. Browne, garage mechanic; N. B. Pope, pedestrian; Henry C. Wilson, Professor S. A. E.; A. B. Cumner, foreman of jury, and eleven jurors.

The Ultra Ideal Car

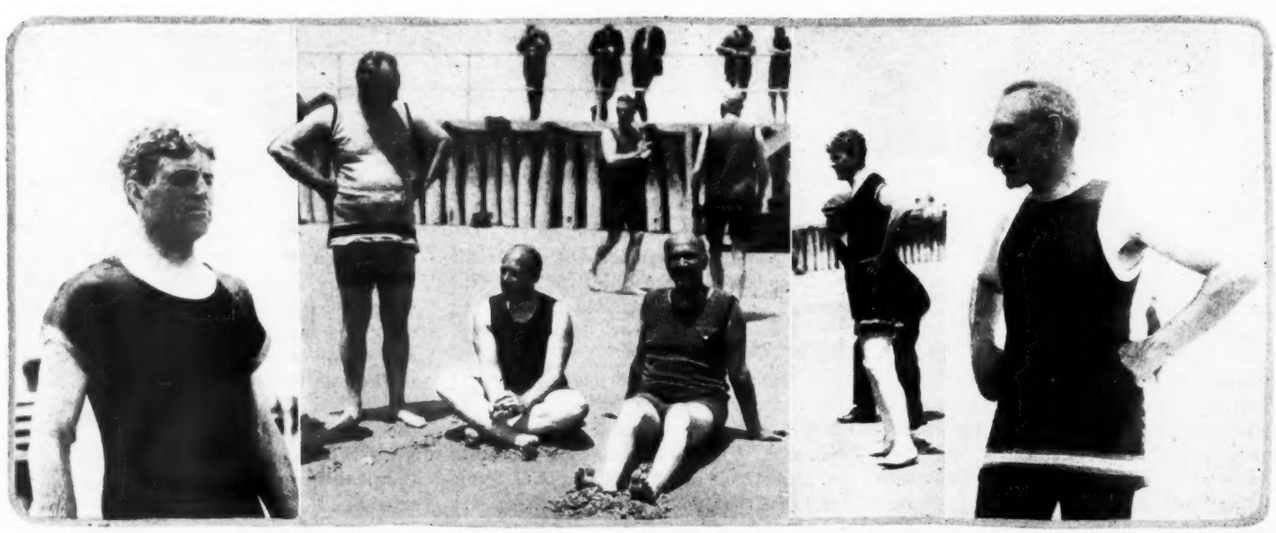
A paper on the ultra ideal car in which the motor, to conform with the specifications, would have had to be a human being, was read as the contribution of the Detroit section of the society. The car was then driven upon the platform and was shown to be a member of the Detroit section, walking within a baby carriage made up to resemble an automobile.

The Indiana Indians, under the leaderchief of F. E. Moscovics, captured John Wilkinson of the Franklin company and put him on trial for making an air-cooled car. After a trial in which he had practically no chance of defending himself, Mr. Wilkinson was sentenced to spend a week in Tarrytown with John D.

C. C. Hinkley, designing engineer of the Chalmers company, was also captured by the Indians and after a brief trial was sentenced to take Henry Ford riding in a Saxon car and to make him like it.

On Thursday evening the management of the hotel tendered a banquet to the society and this was attended by all the members of the party including, as an innovation, the ladies. The banquet was an informal one and no speeches were made at its conclusion except a toast to A. B. Cumner.

After the banquet the party adjourned to the ball room where Orrel A. Parker, president of the Newmastic company, delivered a lecture on the coming European trip which will be made by the S. A. E. in October. The lecture was illustrated by stereopticon views and motion pictures and proved of great interest.



Left—John Wilkinson of the Franklin company. Center—One of the scenes on the bathing beach. At the right are shown Wilkinson and W. H. Conant, with Joseph Bijur on the end

S. A. E. Summer Session a

Left—Henry Hess, R. M. Owen, Walter Baker and Alfred Reeves. Right—Ladies watching the sports on the beach. Among them are Mrs. Clarkson, Mrs. Owen, Miss Weil and Miss Owen

Mrs. Parker, C. W. Hatch, Christian Girl, Orrel Parker and Mrs. Girl

Mrs. Howard Coffin

Mr. and Mrs. John W. Bate

Mr. and Mrs. R. H. Combs

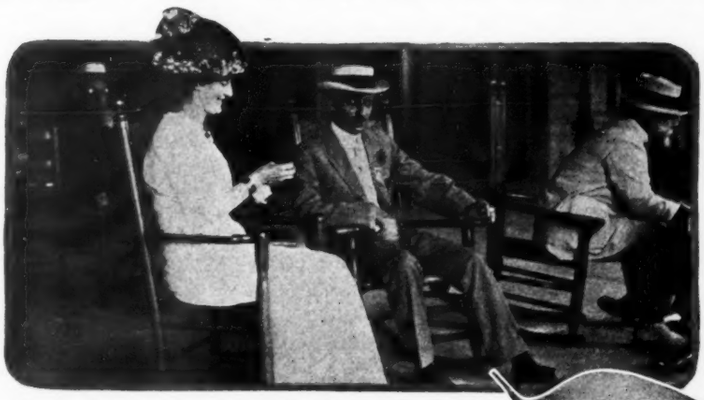
COMBINING business with pleasure is an art that does not seem to have escaped the members of the society if the social end of the 1914 Summer convention can be taken as a criterion. The fact that many of the engineers brought with them their wives and families added the final touch necessary to make the convention a complete success. Those who left their families behind will probably think twice before doing so again and as time goes on it is safe to predict that this annual outing will be looked forward to as eagerly by the ladies as by the men who derive the benefits of the society and yet enjoy the needed amount of relaxation.

Ladies at the Banquet

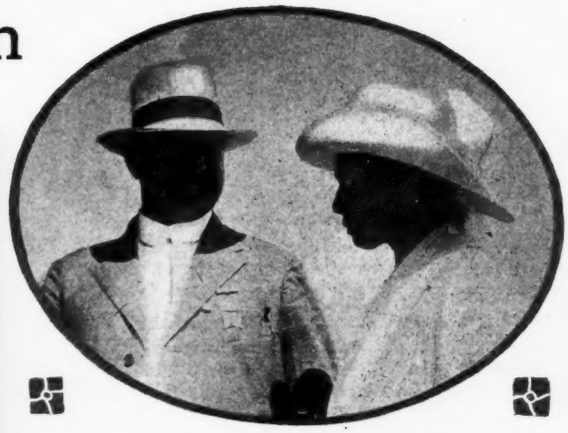
A feature this year which was new to the society was the presence of the ladies of the party at the semi-annual banquet. This is a custom which might well grow, as it affords the one opportunity of the year for the entire party to come together. The annual January banquet is generally more of a business occasion, coming as it does in the Winter season when the opportunities for relaxation are not nearly so great and when most of the members of the society are in New York for business in connection with the show.

The annual convention of the society offers to many an opportunity to enjoy the only vacation of which they can avail themselves and at the same time they can hear or participate in the discussions. The fact that the business taken up by the society at these meetings represents to a large extent the latest development of the industry

Delightful Social Occasion



Mr. and Mrs. C. E. Clement taking advantage of the cool hotel veranda



Mr. and Mrs. Ernest E. Sweet

Mr. and Mrs. Alfred Reeves, Miss Margaret Houk and Mrs. David Beecroft

Mrs. David Fergusson

Walter Baker, President, American Ball Bearing Co.

F. S. Slocum, Jones & Laughlin Steel Co., and Samuel G. Stafford, Vulcan Crucible Steel Co.

makes it imperative that others be present and the opportunity of hearing these developments and at the same time enjoying a short vacation has not failed to be appreciated.

Plenty of Recreation

At Cape May the opportunities of the ladies to enjoy themselves was perhaps greater than it has been in previous meetings. On board the steamships chartered for the past two seasons they were limited in their choice of amusements, but at the seashore they had the attractions of tennis, bathing, automobiling, golf, rambling, dancing in such a varied measure that not a dull moment was experienced. The ladies enjoyed the program of sports to the utmost and were equally well entertained by the plays arranged by the Metropolitan (New York), Indiana (Indianapolis) and Detroit sections of the society.

The weather was pleasant during the entire 4 days and full advantage was taken of the spacious verandas of the hotel. The comfortable porch chairs were always occupied by chatting groups of ladies and these were often joined by the engineers and associate members who were for the time being relieved from the duties of the convention. The surf bathing claimed many devotees. The beach is known as one of the best and firmest on the Atlantic coast and is the place where America's first beach races were held.

Trip by Car Fine

The roads to and from Cape May are among the finest in the East. Several who attended the convention traveled in their cars and found a most enjoyable trip through a picturesque part of New Jersey awaiting them. Those who traveled down from New York found convenient stopping places at Lakewood or Atlantic City with the roads in excellent condition all the way to their destination.

THE AUTOMOBILE

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Lost

TOO many automobile and parts manufacturing companies are not yet awake to the possibilities accruing from attendance at the mid-winter and mid-summer meetings of the Society of Automobile Engineers.

Those who were unfortunate enough not to be able to attend the mid-summer session last week missed an opportunity to hear at first hand lengthy discussions and pertinent papers on subjects which are of prime importance in automobile development to-day.

Those who consider that there is little to be gained from these sessions are neglecting the opportunity of keeping their ears close to the ground to interpret the more or less vague rumblings from which the story of the future must be deciphered.

On a Tangent

Last week's session was not the best attended for summer sessions, largely due to the fact that Cape May, N. J., is too remote from Detroit, Toledo, Indianapolis and Cleveland to permit of heads of many factory departments attending, who generally attend at their own expense being given the necessary time off by the factory. The session naturally suffered because of the absence of such, and this fact will without question be a strong weapon to have next year's session held on the great lakes or in that immediate locality, where it is a short railroad trip from any of the great manufacturing centers.

That the standards committee with its various active sub-committees is still doing valiant service for the automobile industry was once more indicated by the half-day session that this committee gave over to the consideration of the various sub-standard reports before representing them to the council of the S. A. E. and finally to the entire S. A. E. membership as represented at the meeting in open session.

If any criticisms could at one time be pointed towards this committee for over-zealousness in standardizing automobile parts, there is not any place for such criticism, in fact, the industry is to-day requesting that this committee take up actively other aspects of standardizing and push it to completion as rapidly as possible.

The Pigmy Engineer

At last has a fraction of the industry at least come to realize that the work of standardization is a real work, and that it is now high time to call a halt on those engineers who are using parts that vary but very slightly from standard parts, the only reason for such variation being to have something a little different from the other maker. Such insignificant variations are not engineering but mere whims of the egotist, who is following such a nonsensical policy either to carry out a few of his pet whims or is doing it to impress his organization with his importance as an engineer. In ninety-nine cases out of every hundred it is questionable if any rational excuse can be had for such minute variations.

From 247 to 47

The session brought out one or two, perhaps more, glaring needs for further standardization work, and in each case, it is money back of the movement. The lack of standardization makes the parts cost more to the manufacturer and naturally more to the consumer. Standardization will partly eliminate these abuses. No better example of that could be cited than in the case of tapered roller bearings, as cited in the standards committee work. There are at present approximately 247 different sizes of these bearings and the sub-committee on this work has recommended that this be cut to forty-seven. Some of the roller bearing makers have said that they would desire nothing better than cutting the number from 247 to forty-seven and that the 247 different sizes have been made necessary by the demands of automobile engineers, who have demanded different sizes from those used in similar places by other makers.

In Dollars and Cents

And what do these different sizes cost?

One maker places the factory cost of carrying each size at $8,000.

You can readily calculate the difference to the maker in carrying 247 different sizes at $8,000 each and carrying but forty-seven at the same figure each.

Here is one example of the need of more standardization, and but one of the many examples why engineers from all factories should be present at the regular sessions of the society. The 247 different sizes have been borne by the automobile engineers and not by the bearing makers, and the quickest and surest ways of cutting down to forty-seven is to have these same engineers present and listen to the folly of their ways.

From 50 to 15

Cutting the number of sizes of pneumatic tires from over fifty to fifteen is another possibility of the work of the Standards committee. This, too, is a possibility

because over 85 per cent. of the pneumatic tires now used come within these standard sizes.

Some time ago tire manufacturers voiced the cost of manufacturing and carrying in stock such a variety of sizes and dealers have been loud in their complaints, breathing the difficulties of carrying casings of fifty different sizes and the necessary range of inner tubes to fill such demands. Cutting from fifty to fifteen will take a burden off the dealer, it will make the tire question easier to the car owner, and it will unquestionably result in the better adaptation of stock tire sizes to cars when sold by the maker.

The Safety Valve

But the safety valve is also working in this S. A. E. standardization work, and there is little need of any faint-heart running up the danger signal.

One example suffices: The recommendation to makers to use single-wire installations for lighting and starting instead of two-wire systems brought this out excellently, and although the sub-committee made such a recommendation, the society in session refused to ratify it and passed the subject over as a progress report.

Two Blades of Grass

"MAKING two blades of grass grow where one formerly grew," is a high ideal in productiveness as voiced by President Leland in his presidential address to the Society of Automobile Engineers.

This a high ideal for the agriculturist, and metaphorically speaking it is an equally high ideal in the engineering field, in the production field and in the selling field.

Designing one part that will do the work of two, is but another adaptation of this two-blade policy.

Making one pound of steel go as far as two is another chapter in this simple theory of the agriculturist.

Making 1 gallon of gasoline go as far as 2 gallons have formerly carried you is another chapter in the story.

So designing your chassis and so manufacturing your tires that one set will approximate the mileage of two must be counted in as but a corollary of the same axiom.

So rearranging your factory assembly methods so that one set of chassis assemblers do practically as much as two formerly did is another application of it.

So improving your machinery that one machine will do the work of two is in the same category of greater efficiency.

Making one dollar go as far as two formerly did is still another phase of the question and the greatest of all to the buyer, who expects for his one dollar as good if not better materials, design and workmanship.

To attain such a goal is no mean task. There is no royal road to such an achievement. By the sweat of the brow and the application of intelligence only can such an accomplishment be realized.

It calls for the concentration of an entire factory organization to bring about such a result. An engineering force working at its own tangent to the general cycle of activity of the organization cannot be possible in a factory that will develop two healthy blades where one formerly grew.

You cannot be a disciple of the two-blade theory and have a designer who sets his back on the practicalities of foundry practice.

43 Per Cent. of Cars in New South Wales Are American

SYDNEY, N. S. W., AUSTRALIA, June 4—The total registration of automobiles in New South Wales from January 1 to May 14 this year shows 8,615 motor cars, 238 taxicabs, and 497 commercial cars.

For the same period the registrations in Victoria, one of the other countries in Australia, are 7,300 motor cars, and 330 commercial vehicles.

Official figures have just been given out giving the complete registrations from January 1 to December 31, 1913, and these show when contrasted with registrations for the first 4½ months this year that these two countries in Australia are buying motor cars at a much faster rate than a year ago.

The total registration figures from January 1 to December 31, 1913, showed 7,641 private motor cars in New South Wales alone. Of this total 3,347 were American cars, this figure representing 43 per cent. of the total.

A further analysis of the 1913 figures shows that in all 283 different makes of cars are registered, and of these there are eighty-seven different makes recorded. These figures do not include motor trucks or taxicabs.

In point of numbers America takes first place, the Ford registrations totaling 1,043. Overland carries off second place with 434. Third place goes to Europe, Renault having 346. America gets back in line for fourth honors, the Hupmobile registrations showing 323.

Some of the other leading American registrations are: Buick, 201; Cadillac, 155; Metz, 99; Maxwell, 88; Chalmers, 76; Studebaker, 75; Flanders, 68; Brush, 62; Empire, 57; E. M. F., 48; Regal, 44; Detroiter, 38; Hudson, 35; American, 30; Oakland, 29; Reo, 28; Schacht, 28; Oldsmobile, 26; Mitchell, 22; Little Four, 22; Holsman, 21; Krit, 16; Jackson, 13; Michigan, 12; Moline, 12; Cutting, 9; R. C. H., 9; Abbott, 9; Rambler, 8; Paige, 8; Everitt, 7; Thomas, 7; Parry, 7; Henry, 6; Cole, 5; Auburn, 4.

There are three each of the Paterson and Stutz.

There are two each of Pierce-Arrow, Kissel, Marion, Coleman, Stanley, Pope, Herreshoff, Cartercar, Dixie, Black Crow, and Lexington.

There are one each of Anderson, Apperson, Colby, Franklin, Havers, Gt. Western, Garford, Jeffery, King, Lewis, National, Norwalk, Pope-Hartford, Pope-Tribune, Premier, Packard, Pathfinder, McIntyre, Pilot, Pope-Toledo, Nyberg, and Winton.

Some of the leading registrations, irrespective of the country in which they are made, follow:

Ford	1043	Austin	146	Empire	57
Overland	434	Minerva	141	E. M. F.	48
Renault	346	Brasier	106	Regal	44
Hupmobile	323	Metz	99	Detroiter	38
Talbot	305	Napier	94	Hudson	35
Star	273	Clement	93	Oakland	29
Fiat	219	Wolseley	88	Reo	28
Buick	201	Maxwell	88	Schacht	28
F. N.	193	Chalmers	76	Oldsmobile	26
Cadillac	165	Studebaker	75	Mitchell	22
Daimler	164	Flanders	68	Little Four	22
Humber	153	Brush	62	Holsman	21

New South Wales is but one of the six countries comprising the commonwealth of Australia. It has a population of approximately 1,500,000, out of a total of 4,270,000 for all of Australia.

Conditions generally in this country at the present time, in fact through all the six countries in Australia, are very prosperous and even the taxation (commissioner's report, on the income tax) proves that all of Australia is passing through a period of record prosperity. There is every indication of a similar season ahead.

Knight Motors Built for Trade

Moline Co. Decides to Utilize Full License Perquisites with R. B. McMullen as Sales Agent

EAST MOLINE, ILL., June 30—The Moline Automobile Co. of this city is going to build Knight sleeve-valve motors for sale to the motor trade, this decision having been made by W. H. Van Dervoort, president of the company, last week.

The Moline company, while extending its activities in this way, will not drop its car manufacture, but solely utilize to the full the capacity of its motor plant, which will be 20,000 per year, without any additions. The motor department of the Moline company has been in the gasoline motor field for many years and last season marketed over 18,000 motors of one type or another.

For the present its Knight sleeve-valve motor activity will be confined to one model, a four-cylinder design, 4 by 6 inches bore and stroke, this being the same motor that so successfully went through the 336-hour test in January at the laboratory of the Automobile Club of America, New York City. It is reported that a smaller size is at present going through the engineering department. Deliveries will be made practically immediately on the 4 by 6-inch size.

While the manufacture for the trade will be carried out entirely by the Moline company, the marketing of these motors will be looked after exclusively by Robert B. McMullen, Edison building, Chicago, and with a branch office in the Ford building, Detroit. Mr. McMullen for years has been marketing to the manufacturing trade various car parts, such as frames, motors, axles, etc. He thinks that there has not been any more opportune moment for a firm with Moline's reputation as a motor builder to enter into the work of supplying Knight sleeve-valve motors to the trade. The Moline company has a license from Knight & Kilbourne covering the use of the motor for Moline cars as well as selling it generally to the trade, and Mr. McMullen feels that there is no better motor builder.

Buick, Prosperous, to Make 40,000 Cars

NEW YORK CITY, June 29—The Buick Motor Co., a subsidiary of the General Motors Co., had a prosperous year, according to reports, which state that practically every automobile of the 1914 model has been sold, making a total of 32,000 passenger cars, which constituted the capacity of the company's plant. The company has decided to increase the output for 1915 by 8,000 machines, thereby bringing the total output up to 40,000 cars.

The prices for the coming season will be materially reduced. The runabouts will be scheduled at a price $50 lower than that of last year, touring cars $100 less and the six-cylinder cars $335 less. Last year the price of the Buick B-24 model roadster was $950, the B-25 touring car was $1,050 while the B-55 six-cylinder model cost $1,985.

The 1915 models will have some improvements on the design of the bodies. The body will be built so as to give increased facilities for the doors, and the new six-cylinder car will be equipped for seven passengers instead of five. There will be a few slight improvements on the engine design.

Work on the new cars has been going on for some time, so that now the company is in a position to make delivery of its 1915 models between July 5 and 10.

Motion to Sell Pope Factory at Auction

HARTFORD, CONN., June 27—Judge William L. Bennett, of the Superior Court in this city, having declined to authorize the receiver of the Pope Mfg. Co. to accept the offer of $1,800,000 made for the Pope assets in Connecticut and Massachusetts, the offer has been withdrawn. It was made by a syndicate represented by George R. Nutter, of Boston, who stated that he appeared for Daniel Gurnett and James T. Putnam, of Boston, and Carl Bonney, of Worcester, Mass.

As no other bidders have thus far appeared, it is regarded as probable that the properties will have to be liquidated by the receiver, and as the bulk of the assets in Connecticut are in real estate and machinery and the demand for idle factories is not keen the liquidation proceedings will, it is believed, be rather slow.

Under the terms of the reorganization which was to have been effected had the court accepted the offer, a new corporation with $2,800,000 capital was to have been formed and $1,800,000 was to have been paid for the Pope properties. Only $400,000, however, was to be paid in cash, the remaining $1,400,000 to be in 5-year 6 per cent. notes secured by a closed mortgage.

Judge Bennett at a hearing last week classed this as speculation, inquiring whether the proposition was not asking the court to allow the receiver to sell the assets on five years' credit. The syndicate, however, stated that it was unable to offer more and the reorganization movement ended at that point. Neither the stockholders of the old company nor the merchandise creditors were particularly impressed with the offer, as the stockholders stood to realize practically nothing and the creditors did not favor being paid in 5-year notes.

Following the refusal of the court to accept the offer, the creditors' committee, representing chiefly banks, moved that the plants at Hartford, Conn., and Westfield, Mass., be sold at public auction. Judge Bennett ordered a hearing on this motion July 2.

According to Edward M. Day, who represented the Pope interests as chief preferred stockholders, the Westfield plant is valued at $1,464,270.47, and that there are accounts and bills receivable of $396,280.33 and cash of $61,221.49. At the Hartford factory, he stated, are bills receivable of $142,231, and $49,000 cash.

New Fischer-Detroit Light Car for $595

DETROIT, MICH., June 29—A new car, the Fischer-Detroit light car, is being constructed in Detroit by the C. J. Fischer Co., a newcomer in the automobile manufacturing metropolis. The little four-cylinder will be made in one standard chassis, having a wheelbase of 104 inches and 56 inches tread. There will be five models of bodies for two and four-passengers, and the car will sell at $595 to $845.

The motor will have 2¾ inches bore and 4 inches stroke, the radiator will be of the V-type, while the clutch will be either a multiple disk or a cone. There will be a three-point suspension. The transmission will be selective, sliding gear, with three forward speeds and one reverse. The propellor shaft made of 3½ per cent. nickel steel, equippd with Spicer universal joint. The rear axle is of the semi floating bevel gear type, with Hyatt roller bearings on the live axle shaft, which is made from 3½ per cent. nickel steel and has double row of ball bearings on pinion shaft. Front springs are semi-elliptic and the rear three-quarter elliptic, standard.

The bodies are of the streamline type, interchangeable with the standard chassis. Model A is a two-passenger speedster, model B a two-passenger tourist, model C a two-passenger cabriolet, with disappearing window and collapsible top, model D a four-passenger tourist with single door, one man top, and model E a four-passenger sedan. Models A, B, C, have 30 by 3 inches tires, and models D E, 31 by 3½ inches tires. All have 30 by 3 inches artillery wheels, with standard demountable rims.

Standard electric generator system consisting of two headlights and one rear light with connector switch will form the lighting system. The fenders will be of the semi-crown type, black enamel finish.

The equipment will consist of standard electric starter and generator, electric lights and battery, ammeter, speedometer, extra rim, tool kit, jack pump, top, envelope and windshield.

Model A and B will sell at $595, model A will have Houk wire wheels, set of five, standard equipment but no top or windshield. Models C and D cost $645, and model E $845, all F. O. B. factory.

Van Patten Gets Larger Territory

NEW YORK CITY, June 29—L. A. Van Patten, New York City distributor of the Saxon car, has been awarded five new counties in New Jersey in which to sell his car. The new territory includes the following counties: Union, Essex, Morris, Somerset and Middlesex, taking in the cities of Newark, Morristown, Plainfield, New Brunswick, Elizabeth and Perth Amboy. There are at present twenty-seven dealers handling the Saxon in his territory. He expects to increase the number to thirty-three. In addition to the new territory awarded to Mr. Van Patten, he controls the following: Greater New York and Long Island, together with Rockland, Putnam and Westchester counties in this state, and part of Duchess and Sullivan counties; and Fairfield and Berkshire counties in Connecticut.

Houpt Acquires More Territory for Lozier

NEW YORK CITY, June 26—Harry S. Houpt, the Lozier dealer in this city, has been awarded new selling territory. Not only Philadelphia, but the eastern half of Pennsylvania, the whole state of Delaware, the east coast of Maryland, with the exception of Baltimore and Washington, and the southern half of New Jersey, has been put under his control.

Buys Flanders Mfg. Co. Forge

PONTIAC, MICH., June 25—The Pontiac Drop Forge Co., has been organized in Pontiac, Mich., its capital stock being $112,500 and its officers, M. Rothschild, president; E. P. Waldron, vice-president; A. G. Griggs, secretary and D. C. McCord, treasurer. These officers with F. H. Carrol compose the board of directors. The company has purchased the drop

forging plant and equipment of the old Flanders Mfg. Co. and has now one of the most complete forge plants in the country equipped to any and all kinds of carbon, alloyed steel and copper forgings with heat treatment treating and carbonized departments in connection. J. M. McGrieve, well known in the forging trade is superintendent of the works. The company has its headquarters in Pontiac and will start operations at once.

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Savage 20 to Sell for $650

DETROIT, MICH., July 1, *Special Telegram*—Final organization of the Savage Motor Car Co. has taken place. Delbert H. Cummings is president and general sales manager; E. E. Taylor, vice-president; R. W. Fishback, treasurer, secretary and general manager. Headquarters have been secured at 60 Lafayette avenue. Although the plant will be in Detroit, the selection of location has not been decided. The car will be known as the Savage 20 light car, costing $650. It will have a four-cylinder motor, 3 3-8 inches bore, 4 1-4 inches stroke and weighing 1,600 pounds. Only one chassis model and body will be constructed for the present, wheelbase being 108 inches and 56 inches tread. First car to be out about August 15. The concern has been nominally capitalized at $10,000.

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Hurlburt to Operate Bus Lines

NEW YORK CITY, June 30—The Hurlburt Motor Truck Co., this city, has started an innovation in the way of catering to the pleasures of the men down in the Wall street district. It has started a line of buses running from Wall street in the afternoon up to the Polo Grounds. At night a number of buses will leave Times Square for Brighton Beach, stopping at the Hotel Shelbourne.

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FINDLAY, O., June 26—Ray Austin, previously connected with the Studebaker Corp. and the Amplex Motor Co., has been appointed assistant engineer for the Grant Motor Co.

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New York Garage Men to Increase Rents

NEW YORK CITY, June 30—The West Side garages in the city of New York have undertaken to make storage a paying part of the business and to reduce the heretofore unduly large profit on gasoline. A committee of the West Side garagemen met yesterday afternoon, June 29, in the Apthorp Garage, 214 West 80th street, and each man agreed to canvass a certain section of the city on the West Side between 8th and 116th streets and endeavor to induce all garages to raise storage $5 a month and charge a 5 per cent. profit on gasoline. The new rates, if adopted, will be $35 for open cars and $40 for closed cars in the older style of garages and $40 and $45, respectively, in new and first-class buildings. The West Side garages have reduced their prices on "gas" 2 cents, following the recent reductions by the oil company, making the retail price now 22 and 23 cents, according to location.

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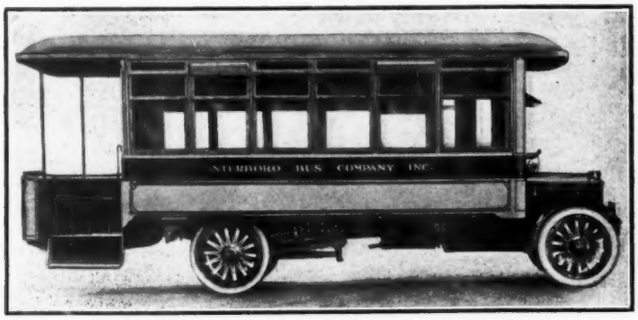
ST. PAUL, MINN., June 26—L. C. Erbes, 1479 Minnehaha avenue, who recently bought the Dilver Mfg. plant, 2654 University avenue, will manufacture commercial cars and Bob Burman's racing car. Mr. Erbes, who is associated with Burman, has bought practically the entire outfit of the Bull Moose Outing Co., Jackson, Mich., and has ordered it shipped to his St. Paul factory. He plans to begin operations in 90 days and to make up to 250 commercial cars a year and six racing machines.



Hurlburt bus for service in New York City

Big Plant Bought by Chevrolet Co.

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Old Maxwell-Briscoe Factory at Tarrytown, N. Y., Acquired for Eastern and Foreign Trade

NEW YORK CITY, June 28—W. C. Durant has purchased the old Maxwell-Briscoe Motor Co.'s plant at Tarrytown to build Chevrolet cars so as to supply the demand on the Atlantic Coast and also the export trade.

Mr. Durant states that the Fifty-seventh street plant in this city and the Tarrytown plant will be combined under the New York management to build the right-hand Chevrolets. After alterations, etc., have been completed in the new Tarrytown plant, it is expected that active operations will commence around January 1, 1915. The output is expected to be at the rate of fifty cars a day. The Flint (Mich.) plant is at present turning out thirty-five cars a day, while the output of the Fifty-seventh street plant is about twenty cars.

The Tarryown property comprises about ten acres of land. The buildings comprise about 205,000 square feet of floor space. The property was held at $267,000.

When the Maxwell-Briscoe Motor Co. was in full operation in Tarrytown it occupied two plants, one known as the Kingsland Point plant, the one just sold, and the other known as the Beekman avenue plant, and employed about 2,500 people. After the liquidation of the old United States Motor Co., that company decided to turn back its holdings into the original companies. The Maxwell-Briscoe Motor Co., one of the concerns included in the U. S. Motor Co., decided to concentrate its efforts in the manufacturing of automobiles in its Detroit plant, and offered for sale four of its plants in the East, two in Tarrytown, N. Y., one in Hartford, Conn., and one in Providence, R. I. The Providence plant was sold to the Universal Winding Co., Providence, in December, 1913.

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Billings & Spencer Buy Columbia Plant

HARTFORD, CONN., June 29—The Columbia plant was sold this week to Billings & Spencer Co., Hartford, Conn., well known manufacturers of machine and hand tools. This plant comprises about 250,000 square feet of floor space. The real estate has been assessed at $250,000 and the machinery at $100,000. The plant was originally erected by the Pope interests. The Columbia & Electric Vehicle Co., later known as the Electric Vehicle Co., then took it over. This company went into the receivers' hands and was later reorganized and known as the Columbia Motor Car Co. The United States Motor Co. then took it over and in due course it became the property of the Maxwell interests.

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Studebaker Six Makes 16 Miles to the Gallon

BUFFALO, N. Y., June 28—Despite the heavy, intermittent rains last Sunday, the Studebaker six averaged better than 16 miles to the gallon of gasoline on the fourth of its five 200-mile runs. The total mileage was 200.6 miles. Twelve and a half gallons of gasoline, 2 quarts of oil and 1 quart of water were consumed. The average mileage secured per gallon of gasoline was 16.04 miles. This beats all the previous records the car has established on this tour. The next run will be made July 5. This will be the last of 200-mile runs of the 1,000-mile economy tour.

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SAGINAW, MICH., June 26—The Saginaw Motor Car Co., Saginaw, Mich., which was organized to build a $395 light car, plans to begin operations this month with an initial output of ten cars. If the company's plans mature it will build 2,000 cars in 1915 and employ 300 men. A. R. Thomas, Detroit, and David Cuthbertson are behind the project. The company has secured the Brooks Motor Wagon plant, 200 by 400 feet.

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Kissel Truck in Transcontinental Trip

NEW YORK CITY, June 26—A KisselKar truck with a carryall body, will be driven across the continent. Charles Courtney will be the driver. He will probably start late in the summer, and will arrive at San Francisco in the spring of 1915 for the Panama-Pacific Exposition.

A Commission to Regulate Competition?

In Measure Before Congress, Federal Board Has Power to Prosecute Unfair Enterprises

NEW YORK CITY, June 29—With the object of broadly covering the subject of unfair competition a bill is now on its way through Congress creating a Federal Trade Commission, which would have powers of investigation into instances of unfair competition by corporations. The measure is regarded as preferable to certain other statutes regulating business conditions in that it attempts to lay down no hard and fast rules or definitions, but gives to the commission those powers which now are vested in the Bureau of Corporations. The measure is substantially like the unfair competition law of Germany. None of the expense attached to investigations falls upon the little business man; it is all borne by the government. If any corporation believes the commission has been mistaken in its rulings or orders, the offending corporation need not discontinue its practices, but may go ahead and leave it to the commission to bring a court action. Any employee of the commission who divulges any information not within the line of his duty shall be subject to a fine not exceeding $5,000 or by one year's imprisonment or both if he is convicted.

An extract from the law follows:

Provide: That unfair competition in commerce is hereby declared unlawful.

The commission is hereby empowered and directed to prevent corporations from using unfair methods of competition in commerce.

Whenever the commission shall have reason to believe that any corporation has been or is using any unfair method of competition in commerce, it shall issue and serve upon such corporation a written order, at least thirty days in advance of the time set therein for hearing, directing it to appear before the commission and show cause why an order shall not be issued by the commission restraining and prohibiting it from using such method of competition, and if upon such hearing the commission shall find that the method of competition in question is prohibited by this Act it shall thereupon issue an order restraining and prohibiting the use of the same. The commission may at any time modify or set aside, in whole or in part, any order issued by it under this Act.

Whenever the commission, after the issuance of such order, shall find that such corporation has not complied therewith, the commission may petition the district court of the United States, within any district where the method in question was used or where such corporation is located or carries on business, praying the court to issue an injunction to enforce such order of the commission, and the court is hereby authorized to issue such injunction.

Market Reports for the Week

MARKET PRICES in general remained unchanged last week. Tin had a fluctuating week of it and closed at a loss of $.20 per 100 pounds. At the closing on Tuesday, it was slightly firmer, with an active demand for small lots of nearby positions from domestic consumers. Both coppers dropped in prices, due to considerable irregularity in the market. Lead was again steady at $3.90. Cottonseed oil rose to $7.23 a barrel. On Tuesday this product was very dull in the market, there being no interest shown by refiners and an absolute indifference on the part of speculators.

Material	Wed.	Thurs.	Frl.	Sat.	Mon.	Tues.	Week's Changes
Antimony	.05¾	.05¾	.05¾	.05¾	.05¾	.05¾	.....
Beams & Channels, 100 lbs.	1.26	1.26	1.26	1.26	1.26	1.26	.....
Bessemer Steel, ton	19.50	19.50	19.50	19.50	19.50	19.50	.....
Copper, Elec., lb.	.13⅝	.13½	.13½	.13½	.13⅜	.13⅜	—.00⅛
Copper, Lake, lb.	.13⅜	.13⅜	.13⅜	.13⅜	.13½	.13⅝	—.00½
Cottonseed Oil, bbl.	7.11	7.21	7.18	7.21	7.27	7.23	+.12
Cyanide Potash, lb.	.17	.17	.17	.17	.17	.17	.....
Fish Oil, Menhaden, Brown	.40	.40	.40	.40	.40	.40	.....
Gasoline, Auto, bbl.	.14	.14	.14	.14	.14	.14	.....
Lard Oil, prime	.93	.93	.93	.93	.93	.93	.....
Lead, 100 lbs.	3.90	3.90	3.90	3.90	3.90	3.90	.....
Linseed Oil	.54	.54	.54	.54	.54	.54	.....
Open-Hearth Steel, ton	19.50	19.50	19.50	19.50	19.50	19.50	.....
Petroleum, bbl., Kans., crude	.75	.75	.75	.75	.75	.75	.....
Petroleum, bbl., Pa., crude	1.75	1.75	1.75	1.75	1.75	1.75	.....
Rapeseed Oil, refined	.59	.59	.59	.59	.59	.59	.....
Rubber, Fine Up River, Para	.69	.69	.69	.69	.69	.69	.....
Silk, raw, Ital	..	5.00	..	..	5.00	5.00	.....
Silk, raw, Japan	..	4.40	..	..	4.40	4.40	.....
Sulphuric Acid, 60 Baume	.90	.90	.90	.90	.90	.90	.....
Tin, 100 lb.	30.65	29.80	30.00	30.00	30.38	30.45	—.20
Tire Scrap	.04¾	.04¾	.04¾	.04¾	.04¼	.04¾	.....

Discuss Workmen's Compensation Act

NEW YORK CITY, June 25—The workmen's compensation act was discussed from the angle of the employer at a meeting held recently by the Merchants' Assn. The matter of the desirability of employers insuring through the state fund created by the new law, or through stock insurance or mutual insurance companies, chiefly occupied the speakers.

Edmund Dwight, manager of the Employees' Liability Assurance Corp., stated that he believed some employers would carry their own risks, as is permissible under the law, but they would be few and would include chiefly the very large employers. He stated that it would be reasonably advantageous to employers to take out policies with the state fund, With the stock companies, he said employers would find a protection which is absolutely essential considering the hardships that he was inclined to believe the new law inflicted.

Professor F. S. Baldwin, manager of the State Insurance Fund, declared that the state fund offered very good attractions to employers large or small because they got a rate not obtainable otherwise, were relieved of all further liability, and would get the benefits of dividends and reductions for merit.

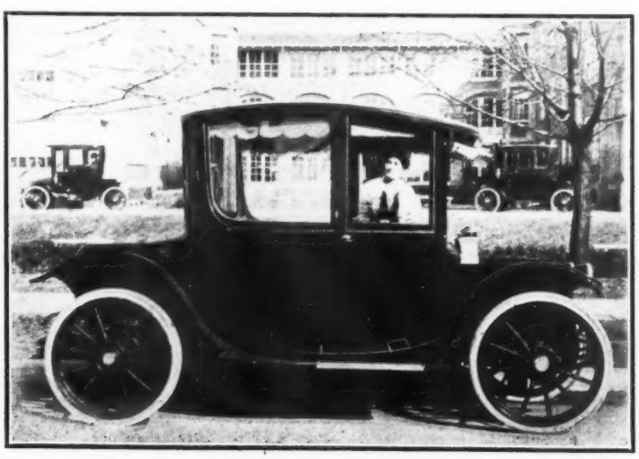
Crops Point to Indiana as Car Market

INDIANAPOLIS, IND., June 29—At the conclusion of a most successful year, the motor car industry in Indiana is looking forward to an even more successful season. In almost every instance dealers have not only sold out their 1914 allotments, but they have been obliged to call on the factories for additional cars.

The reason for the bright outlook is the fact that Indiana will have some of the largest grain crops in its history. The wheat crop, now being cut, is estimated as being twenty-five per cent. larger than that of last year and of much finer quality.

Reports from over the state are that the corn crop is in perfect condition and that a record breaking crop may be expected. Oats are not in as good condition as might be expected, but even at that the crop will be large.

These conditions seem to spell prosperity for the motor car trade. This is borne out from the unusually large num-



New four-chair brougham made by the Waverly Co., Indianapolis, Ind. Note ample window space

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ber of motor car sales that are now being made in the rural districts and smaller communities and in the many prospects for motor car sales in those localities during the new season.

Automobile Trade Thriving

NEW YORK CITY, June 26—It speaks well for the automobile business that the exports of motor vehicles and parts have shown a consistent increase in valuation over last year when most other manufactured articles ready for use show a marked falling off in exports and when the total exports for 10 months ended with April are less by $59,000,000, or nearly 2.8 per cent., than for the 10 months ended with April, 1913.

Bankers and investors who may have entertained doubts may find reassurance about the condition of the industry in a comparison of exports made by the National Automobile Chamber of Commerce from the current Summary of Commerce and Finance issued by the U. S. Department of Commerce.

Fisk Tire Sizes and Prices Cut

CHICOPEE FALLS, MASS., July 1—Beginning today, the Fisk Rubber Co. makes reductions in certain tire sizes. In plain tread casings the reductions apply only to 3 and 3½-inch sizes; all non-skid sizes are reduced; tubes remain the same.

The 30x3½ plain tread was $17.00; now is	$16.55
The 30x3 plain tread was $13.85; now is	12.30
The 34x4 non-skid was $36.60; now is	31.60
The 36x4½ non-skid was $46.35; now is	42.65

Rebates will be extended to dealers on any stock on hand at the time of the reduction, provided a serial inventory accompanies the application for rebate. These reductions are said to be due to increased production in the styles and sizes affected. The non-skid production has been practically trebled in the last 60 days.

It is the intention shortly to introduce a non-skid tire, in design similar to the present Town Car Tread, which will be known as the Fisk Red Top. This will be made only in Ford sizes and should prove an attractive seller. Salesmen will show samples and orders can be placed for delivery the latter part of July.

3,408 More Trucks in Chicago Since 1911

CHICAGO, ILL., June 29—There has been an increase of 3,408 commercial cars in this city since 1911, according to figures compiled by Edward Cohen, city collector. During the same period is noted a decrease of 1,789 in two-horse wagons. In April of this year only seventeen four-horse vehicles were in use in Chicago. The 3,408 commercial cars may be divided up into 2,012 delivery wagons of less than 1-ton capacity, while 1,396 are heavy-duty trucks.

NEW YORK CITY, June 26—The board of directors of the United States Rubber Co. have declared from its net profits a quarterly dividend of 2 per cent., on the first preferred stock, a quarterly dividend of 1 1-2 per cent. on the second preferred stock, and a quarterly dividend of 1 1-2 per cent. on the common stock of the company, to stockholders of record at 3 p. m. on July 15, 1914, payable without closing the transfer books, July 31, 1914.

Automobile Securities Quotations

NEW YORK CITY, July 1—The automobile securities market was rather inactive during the past week, a number of the stocks showing no changes whatever, while the majority of those which showed changes experienced slight declines of not over 2 or 3 points, many of them being changes of only a fraction of a point. The only gains to be noticed were: Firestone preferred, ½ point; Gray & Davis preferred, 3 points; Reo Motor Truck Co., ¼; Texas Co., ¼; Overland common, 2 points and Overland preferred, ½ point. There were two or three companies whose stocks showed a considerable drop according to the bid figures but which really remained about the same in general tone. The complete tabulation for the past week follow, giving the quotations for each day and also the 1913 figures:

Security	Wednesday Bid	Wednesday Asked	Thursday Bid	Thursday Asked	Friday Bid	Friday Asked	Saturday Bid	Saturday Asked	Monday Bid	Monday Asked	Tuesday Bid	Tuesday Asked	Week's Change	1913 Bid	1913 Asked
Ajax-Grieb Rubber Co. com	220	..	220	..	220	..	220	..	220	..	220	..	..	155	165
Ajax-Grieb Rubber Co. pfd	99	..	99	..	99	..	99	..	98	104	98	104	..	94	99
Aluminum Castings pfd	98	100	98	100	98	100	98	100	98	100	98	100	..	97	100
Case T. M. Co., J. I.	80¾	90	80¾	90	81½	90	81½	89	80¾	90	80¾	90	— ¼	..	..
Chalmers Motor Co. com	99	103	99	103	99	103	99	103	98	103	98	103	—1	135	..
Chalmers Motor Co. pfd	95	98	95	98	95	98	95	98	95	98	95	98	..	98	102
Electric Storage Battery Co	51	51¼	51	51¼	50½	51½	51	51¼	51	51½	51	51½	..	..	..
Firestone Tire & Rubber Co. com	300	305	300	305	300	305	300	305	299	304	299	304	—1	270	280
Firestone Tire & Rubber Co. pfd	108	109½	108	109½	108	109½	108	109½	108½	110	108½	110	+ ½	104	106
Garford Co. pfd	75	85	75	85	75	85	75	85	75	85	75	85	..	85	95
General Motors Co. com	91	91½	88	90	90	92	90	92	91	91½	91	91½	—2	26	32
General Motors Co. pfd	92	93½	92	93½	92¼	95	92	94	92	93½	92	93½	—1	72	77
B. F. Goodrich Co. com	23	23¾	23¼	23½	23⅛	24	23⅛	23½	23	23¾	23	23¾	—1½	27	28
B. F. Goodrich Co. pfd	88⅛	90	85	88	86¼	87⅛	87	88½	88¼	89	88¼	89	..	90½	92½
Goodyear Tire & Rubber Co. com	170	175	170	175	170	175	170	175	166	172	166	172	—4	325	332
Goodyear Tire & Rubber Co. pfd	97	99	97	99	97	99	97	99	96	98	96	98	—1	97	98
Gray & Davis Co. pfd	95	102½	95	102½	95	102½	95	102½	98	102	98	102	+3	..	..
International Motor Co. com	..	5	..	5	..	5	..	5	..	3	..	3	..	3	6
International Motor Co. pfd	3	10	3	10	3	10	3	10	3	9	3	9	..	18	25
Kelly-Springfield Tire Co. com	58	60	55	57	56	58	55	58	56	58	55	58	—3	..	..
Kelly-Springfield Tire Co. 1st pfd	74	78	70	80	70	80	73	77	76	80	70	80	—4	..	..
Kelly-Springfield Tire Co. 2d pfd	99	100	90	100	90	100	90	95	94	100	90	100	..	..	..
Lozier Motor Co. com	15	20	15	20	15	20	15	20	..	20	..	20	..	15	20
Lozier Motor Co. pfd	..	41	..	41	..	41	..	41	..	41	..	41	..	..	90
Maxwell Motor Co. com	13¾	14	13⅛	13½	13¾	14	13¾	14	13¾	14	14	14¾	— ½	3	3½
Maxwell Motor Co. 1st pfd	40	41	39½	40½	40¾	42	40	42	40½	41½	40	42	—3	7½	9
Maxwell Motor Co. 2d pfd	16¾	17½	16	17	17	17¾	17	18	17¼	18	16½	18	—1	26½	28
Miller Rubber Co	139	142	139	142	139	142	139	142	138	140	138	140	—1	133	137
New Departure Mfg. Co. com	126	128	126	128	126	128	126	128	126	128	126	128	..	..	..
New Departure Mfg. Co. pfd	106¼	..	106½	..	106½	..	106½	..	106	..	106	..	— ¼	..	..
Packard Motor Co. com	103	..	103	..	103	..	103	..	93	..	93	..	—10	..	..
Packard Motor Co. pfd	97	100	97	100	97	100	97	100	97	100	97	100	..	..	..
Peerless Motor Co. com	18	25	18	25	18	25	18	25	10	17	10	17	—8	45	50
Peerless Motor Co. pfd	..	62½	..	62½	..	62½	..	62½	..	50	..	50	..	..	96
Pope Mfg. Co. com	..	1	..	1	..	1	..	1	..	1	..	1	..	..	11
Pope Mfg. Co. pfd	..	3	..	3	..	3	..	3	..	3	..	3	..	..	36
Portage Rubber Co. com	..	40	..	40	..	40	..	40	..	30	..	30	..	30	40
Portage Rubber Co. pfd	..	90	..	90	..	90	..	90	..	90	..	90	..	96	99
*Reo Motor Truck Co	10¾	11¾	10¾	11¾	10¾	11¾	10¾	11¾	11	11½	11	11½	+ ¼	10	11½
*Reo Motor Car Co	18	19	18	19	18	19	18	19	17¾	18¼	17¾	18¼	— ¼	19	20½
Rubber Goods Mfg. Co. pfd	100	110	100	110	100	110	100	110	100	110	100	110	..	..	..
Russell Motor Co. com	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Russell Motor Co. pfd	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Splitdorf Electric Co. pfd	40	50	40	50	40	50	40	50	40	50	40	50	..	..	..
Stewart Warner Speedometer Corp. com	48	49	48	49	48	49	48	49	47½	48½	47½	48½	— ½	..	..
Stewart Warner Speedometer Corp. pfd	98	100	98	100	98	100	98	100	97½	99	97½	99	— ½	..	..
Studebaker Co. com	28¾	29½	28¼	29½	28	28⅞	29¼	30	28⅜	29½	28¾	29½	—2	22½	28
Studebaker Co. pfd	85	87	82	84½	80	83	80	82½	85	87	85	87	..	82	87
Swinehart Tire & Rubber Co	85	86	85	86	85	86	85	86	85	86	85	86	..	85	88
Texas Company	143½	143⅞	141½	142	142½	143½	143	144	143½	144	143½	144	+ ¼	..	..
U. S. Rubber Co. com	57½	57¾	57½	58¼	58	58½	58¼	58⅝	57¼	57¾	57¼	57¾	—1½	59	59½
U. S. Rubber Co. 1st pfd	101½	102¼	101¾	102	102⅛	103	102½	103	101½	102¼	101½	102¼	—1½	102¼	103¼
Vacuum Oil Co	219	221	216	218	217	220	217	220	218	221	220	222	—1	..	..
White Co. pfd	107	110	107	110	107	110	107	110	107	110	107	110	..	102	104
Willys-Overland Co. com	80	81	79	80	79	80	80	81	79	80	82	85	+2	56	66
Willys-Overland Co. pfd	93	95	91	95	91	94	92½	95	92	95	93	95	+ ½	84	90

*The par value of these stocks is $10; all others $100.

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Seize Automobiles Left Unattended

New York City Street Cleaning Department Enforces an Antiquated Ordinance

NEW YORK CITY, June 29—Just how far public opinion will justify the rule put into force by the Street Cleaning Department of this city on June 27, when twenty-four automobiles left on the streets unattended were seized as encumbrances, is not known, but the move on the part of this department, it seems, is marked by more zeal than common sense.

On that date eight taxicabs of the Mason-Seaman Co. were taken, together with eleven private touring cars and a motor truck. Just what right a public official has in seizing cars is not known, but it looks like confiscation for a person to deliberately step into a private automobile and drive it off to an automobile pound where it is held until the owner pays a fine of from $5 to $10. Such a regulation is obviously intolerable.

The authorities state that it is their desire to discourage the practice on the part of some garagemen of using the streets for repair-shops and wash-stands. Were their activities confined to the extent of which they speak, the opposition aroused undoubtedly would not have been so strong, but the officers seized any and every car found standing at the curb, regardless of how long it had been standing, or for what purpose it had been left, impounded them and required the owners to pay a fine before cars would be released.

Left for 5 Minutes—Car Is Seized

An instance of how far these officials overstepped their authority is shown in the case of a Ford car which stopped in front of the Cutting-Larson Co.'s Oldsmobile establishment. The owner went to the basement for parts, staying about 5 minutes. When he came out his car had disappeared. The officials had hitched a chain and a pair of horses to his car and dragged it away to the encumbrance yard.

There was a Cadillac standing back of this Ford. The owner was inside a repair shop paying his bill for a recent repair done to the car. His car was taken, and he was obliged to travel across the city and pay a fine of $5.

Another instance cited shows how a truck owner was made to pay a fine even when he accompanied the officials himself to the pound. His truck had been standing in front of the White service station and had not been there more than 5 minutes when officers came along and said they were going to hitch chains on it and take it to the pound. Rather than have the vehicle thus treated, they were informed that a chauffeur would drive it to the pound, which he did. He paid his fine, however.

Eleven taxicabs standing at officially designated cabstands were seized if chauffeurs were not with the cabs, even though they were but a short distance away, and these cars were impounded with the others.

Private owners are inquiring how it is to be possible for them to operate their cars in the downtown section and drop into business places unless they go to the expense of employing a chauffeur.

One other thing the automobile owners are kicking about is that they were given no notice of the impounding action.

Means Owner Must Have Chauffeur

With the present New York law in force, an automobile owner is prevented from driving up to an accessory house to buy a tire or anything that he needs, without having a chauffeur or competent driver in the car. Furthermore what is the man who cannot afford a chauffeur going to do? The number of private cars in this city driven by their owners vastly outnumbers either public vehicles or cars, the owners of which hire chauffeurs. Not all the garages or public parking places in the city could supply the need if there should be an endeavor to enforce the rule that cars shall not be left unattended.

J. S. Frazee, president of the Long Island Automobile Club, stated that in his opinion there had been an old ordinance which prohibited the leaving of vehicles standing in the streets without drivers or automobiles without competent chauffeurs, but that it was pretty much of a dead letter. An attempt had been made to enforce it in 1907 or 1908, but after that it was allowed to drop.

That the city officials have aroused the ire of many of the car owners is evidenced by the fact that certain of these owners have threatened to bring suit against the city for alleged confiscation. The Long Island Automobile Club has also announced its intention of entering into the fight against this latest innovation started by the municipal government. It states that should the Street Cleaning Department attempt to force a strict observance of such an ordinance, not only in the business avenues, but in the residence streets and other thoroughfares of the city, it will certainly carry the matter to the courts and have a test case made of the restriction.

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Philadelphia Club Insurance Plan Saves 40 Per Cent.

PHILADELPHIA, PA., June 27—A new plan of co-operative automobile insurance restricted to owners of non-commercial cars, which has been in a formative state for about 3 months, has been perfected, the details of which were announced today by the Automobile Club of Philadelphia.

Under the auspices of the Pennsylvania Motor Federation, the Automobile Club of Philadelphia and various other similar organizations, the Pennsylvania Indemnity Exchange has been organized under the laws of this state.

The forms of insurance will cover a wide field, embracing fire, collision, theft, property damage and personal liability, the plan of operation being as follows:

Initial premiums will be based on standard rates of stock companies and a fixed portion of premiums will be set aside for all operating expenses. The balance of the premiums will go into a fund for the payment of losses, and at the end of every 2 weeks such losses will be pro-rated among the members in proportion to their premium payment. At conclusion of policy year each member's ledger account will be balanced and such saving as may have been effected will be returned to the members in cash or credited on the following year's premium, as members may choose.

Minimum expenses for operation, membership limited to the highest grade risks, elimination of stock company profits and rigid inspection of each risk are expected to save members from 20 per cent. to 40 per cent. over the rates of insurance now in force. As no taxicabs or commercial cars will be insured, the extra hazard and cost of insurance for pleasure car owners will be reduced to a minimum. Membership in the Pennsylvania Indemnity Exchange will be open to all owners of pleasure cars.

The Pennsylvania laws require that an insurance exchange of this character must have subscribers for membership the aggregate amount of whose insurance must total at least $1,500,000, thus requiring sufficient risk to produce a fair average. This, together with other safeguards provided, will put the Exchange on a sound basis.

So far the following trustees have been appointed: John B. Stetson, Jr., Alfred R. Wiggan and M. F. Littleton, Jr.

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Weed Finally Enjoins Frasse Company

NEW YORK CITY, June 27—Judge Hand, in the U. S. District Court for the Southern District of New York, to-day granted a perpetual injunction in favor of the plaintiffs in the suit of the Weed Chain Tire Grip Co. against the Frasse Co. The Court found that the Frasse Co. had infringed the Parsons patent No. 723,299 covering the well-known Weed Tire Chain construction.

As the Frasse Co. had already settled in full for all damages and profits accruing by reason of past infringement when the injunction was granted no provision is made in the decree for the recovery by the complainant of costs, profits or damages.

The injunction states in connection with the infringement of patent No. 723,299:

"The defendant, the Frasse Co., has infringed upon said Letters Patent 723,299, and upon the exclusive rights of the complainant under same, without leave or license from the complainant, selling cross chains, side chains, cross chain hooks, side chain hooks, German machine chain for cross chains, Triumph chain for side chains, and other material and parts adapted or intended to be used in the manufacture or repair of chain grips covered by said Letters Patent, and aiding and prompting infringement of said Letters Patent by others by offering such parts of material to customers with the advice and recommendation that they be used and with the knowledge that they would be used in making or repairing chain grips and by displaying in connection with

such parts and material advertisements that such parts and material were for use in making or repairing chain grips.

"The defendant having settled in full for all damages and profits accruing by reason of past infringement of said patent by defendant and by defendant only and for cost, no provision is made for the recovery by the complainant of costs or of profits or of damages as aforesaid, and this decree is hereby made final."

Stromberg Gets Preliminary Injunction

NEW YORK CITY, June 27—An order has been signed by Judge Hand, in the U. S. District Court for the Southern District of New York, granting a preliminary injunction to the Stromberg Motor Devices Co. against Ludwig Arnson and Alfred Michaelis, doing business as a copartnership under the name of Longuemare Carburetor Co.

The injunction was asked by Charles W. Stiger in an affidavit filed last week, the injunction to restrain the defendants from further alleged infringements of the Richard and Ahara patents pending the settlement of the suit.

Several other affidavits were filed last week as follows:

John A. Dienner deposed under date of June 24 that he was employed from June, 1910, to January 3, 1914, in the United States Patent Office as assistant examiner, and in the course of his work was unable to find the alleged French patent No. 238,392 of May 28, 1894, entitled Pour moteur à petrol à alimentation pneumatique regulable by F. B. Poerschmann. In the records of French patents in the Public Library of Chicago he was unable to find specifications or drawings corresponding to this. In the British Patent files the application by Poerschmann No. 12,390 and dated July 26, 1894, was marked abandoned. In the German files there is no patent of corresponding subject, matter and title according to Mr. Dienner. The Poerschmann patent is alleged by the defendants to antedate the Ahara and Richard patents.

Kempster B. Miller, and Raymond M. Anderson state in an affidavit that they never heard of a device in practical use called by the name of Poerschmann and that they did not believe there ever was made a practical and operative structure such as that set forth in this so-called French patent. They also aver that the Poerschmann construction certainly does not have the construction or mode of operation, nor can it secure the result of the inventions of the Richard and Ahara patents in suit. After explaining the alleged and practical features of the Poerschmann construction and their wide difference from the Richard and Ahara patents, Messrs. Miller and Anderson point out fifteen points of identity in construction and operation alleged to exist between the Ahara and Richard patents on the one hand and the Longuemare on the other, and state that not one of these essential points is found in the so-called Poerschmann patent.

Can't Sue Employers Insured Under State Fund

NEW YORK CITY, June 26—According to a new ruling recently announced by the Workmen's Compensation Commission, it is stated that employers insured under the state fund for hazardous occupations will be protected from all civil suits for damages by injured employees.

Section 53 of the Compensation act gave the employer full protection from damage suits, the commission said. By special resolution the commission set forth both the text, and this interpretation of the section:

"All employees of an employer, whose business is a hazardous employment within the meaning of the Workmen's Compensation Act, are held by this commission to come within the provisions of the act, and therefore have no right to bring action for damages against their employer on account of injuries received in the course of employment."

Asks Bill of Particulars in Shim Suit

NEW YORK CITY, June 29—In the suit of Eric G. Lindhe against the Laminated Shim Co. brought May 23, a motion for a bill of particulars has been endorsed by Judge Hand, in the U. S. District Court for the Southern District of New York. Thirty days are given to serve the bill of particulars with leave to the plaintiff to enter an order vacating the order, taking the counter claim pro confesso and to reply thereto within 10 days after the filing of the bill of particulars.

Supreme Court Finds State Law Supreme

CHICAGO, ILL., June 28—That this city cannot make regulations inconsistent with the motor vehicle act, has been held by the Illinois Supreme Court, in a suit brought by the City of Chicago against C. R. Francis. It was also held that an ordinance requiring the owner of a motor vehicle, not a motor truck or a motor-driven commercial vehicle, to display numbers other than the number of the registration seal issued by the secretary of state, is void.

Under the present motor vehicle act a city may make and enforce reasonable traffic and other regulation except as to rates of speed, provided such regulations are not inconsistent with the motor vehicle act and the conditions are such as to warrant them.

Garages Gain in Separator Case

Testimony That Little Gasoline Reaches Sewers Impresses New York Board

NEW YORK CITY, June 30—The Welfare Committee of the City Council, before which the question of oil separators for garages has been under investigation for some time, has reported favorably to the Board of Aldermen of the city on the resolution of the dealers and garagemen of New York to the effect that the section of the municipal code calling for the use of oil separators be eliminated.

The question of oil separators is a long mooted one in New York City and there are at present some seventy or eighty suits for failure of garage men to use separators in the courts. It was not until the New York dealers took the matter up actively that this Welfare Committee gave it serious attention. The dealers employed expert chemists to make analysis on the value of these separators and it was reported the value was so slight as to be negligible. The dealers' other basis of complaint was that there was not any necessity for separators. The matter will next come before the entire city council.

At the last hearing on June 26 Attorney Charles Thaddeus Terry led the forces of the New York Garage Association, the Automobile Dealers' Assn. of New York City, Brooklyn Garage Owners' Board of Trade, the Brooklyn Motor Vehicle Dealers' Assn. and the American Automobile Assn.

Dr. Russell W. Moore, the fire department chemist, testified that in 307 working days there were taken from forty-seven garages about 3,500 gallons of separator refuse, which was 40 per cent. gasoline.

Trying Out Electrics for Taxicab Service

NEW YORK CITY, June 29—Whether or not the electric vehicle will supplant the gasoline car at the taxicab station at the Grand Central Depot is not as yet determined, but there is a possibility of it so doing. Since June 19 a Rauch and Lang electric has been in regular public service at the Grand Central station. This cab is fitted with a landaulet type of body, with a seating capacity for five passengers, and facilities for carrying truck and luggage.

There is a depression on the Vanderbilt avenue side of the station, suitable for taking on passengers and also for storing the taxicabs. Some doubt has arisen as to whether gasoline cars may be kept there on account of the close proximity to the Hotel Biltmore, and also on account of a clause in the city statutes against storing or running gasoline motors underground or under an inclosure. An investigating committee has been formed consisting of Messrs. Whaley of the N. Y., N. H. and H. Railroad, Katte, chief engineer of electric traction of the N. Y. Central lines, and Miles Bronson, manager of the Grand Central Terminal Assn. This committee expects to make a definite statement in about 2 months.

New Tax Rate Proposed for D. C. Motorists

WASHINGTON, D. C., June 30—*Special Telegram*—An increased tax for District of Columbia motorists is proposed by Congressman Page, of North Carolina, in a bill introduced today. The tax funds are to maintain roads outside the city fire limits. The bill provides tax of $5 a year for cars of twenty-five horsepower and under, $7.50 for cars from 25 to 40 horsepower, and $10 for more than 40 horsepower. These rates will apply to visiting motorists who keep their cars here more than two periods of 5 days each year. Present law provides license fee of $2 per car, which is perpetual.

Hazeltine Valve Grinder Patent Upheld

NEW YORK CITY, June 26—The Hazeltine valve grinder patent No. 13,421, owned by the Specialty Machine Co., is valid and is infringed by the Ashcroft Mfg. Co., according to the opinion of the United States Circuit Court of Appeals in New York City. The patent is a reissue of No. 918,049, and the defendant had claimed that the lapse of time between the issue and the reissue barred the Specialty company from bringing a suit. The lower court agreed with this and dismissed the bill of complaint, but the appellate court held that since reissue narrowed instead of broadened claims it was valid. It also found the Ashcroft device to infringe.

Boiling Oil Petrifies Track for Sioux City Races

Drivers and Officials Arrive for 300-Mile Grind—Banked Turns Stand 90 M. P. H.

SIOUX CITY, IA., June 29.—The work of grooming the 2-mile speedway for the $25,000 race of 300 miles to be staged there on July 4, has been completed and speed tests on the dirt oval the past few days have developed the fact that some of the fast cars will be able to go into the ten-foot embankment curves at a speed of close to 90 miles an hour. It has been demonstrated that the surface in the stretches is so fast that better than 100 miles an hour can be attained by some of the speed creations.

Thousands of gallons of boiling oil have been poured upon the surface of the track during the past few days, practically petrifying the top soil. The 10-ton steam rollers are being used to level the surface and make the track as hard as macadam. Work on the enormous grand stands has been progressing rapidly and the demand for tickets has been so great that the management is arranging to erect more stands than were originally proposed.

Nearly all of the drivers entered have arrived with their cars. On Monday, June 29, practice began under official supervision. Fred J. Wagner, who is to start the race, arrived in Sioux City on Saturday; also F. E. Edwards, of the technical committee. Other out-of-town officials are expected to arrive today and the early part of the week.

Interest beyond all expectation is being shown in the race in that section of the Middle West. Automobile clubs throughout Iowa and surrounding states are arranging tours to terminate at Sioux City on the night of the 3rd, and all the railroads making connections for Sioux City are arranging excursions within distances of 500 miles.

The entries include Wishart, Mercer; Knipper, Delage; Grant, Sunbeam; Babcock, Sunbeam; Oldfield, Stutz; Anderson, Stutz; Mulford, Peugeot; Burman, Peugeot; Stringer, Peugeot; Patschke, Marmon; Keene, Beaver Bullet; Bauer, National; Le Cain, Chevrolet; Horan, Metropol; Chandler, Braender Bull Dog; Wilcox, Gray Fox; Bennett, Moon; Brock, Ray; Mason, Mason; Callahan, Stafford; Wetmore, Chalmers; Klein, King.

Twenty-five Entries to Date for Tacoma

TACOMA, WASH., June 26—To date there are twenty-five entries for the Tacoma road races, to be held July 3 and 4. A few of the cars have been out for practice spins and have reeled off some very fast laps. On June 22 Brock in his Portland-built special and Cooper in his Stutz sparred for the honor of the fastest lap yet to be run on the new Tacoma speedway, and late in the afternoon Brock won. Cooper did his lap in 1:38 and then Brock sent his car around the track for a lap in 1:36:4-5. Hughie Hughes in a Maxwell made a lap in 1:40. The entries for the Tacoma road races, corrected to June 23, read as follows:

DRIVER	CAR	DRIVER	CAR
Tetzlaff	Maxwell	Carlson	Maxwell
Hughes	Maxwell	Verbeck	Fiat
Kennedy	Chalmers	Taylor	Alco
Klein	King	Cooper	Stutz
Welch	Fiat	Croston	Chevrolet
Terrion	Regal	Pullen	Mercer
Parsons	Franz	De Alene	Marmon
Ruckstall	Mercer	Barnes	Romano
Thomas	Locomobile	Brock	Ray
McGoldrick	National	Smyley	Hupmobile
North	Mercer	Sorell	Fiat
Earl Staley	Studebaker	Dingley	Ono
Malcolm, H. L.	Hudson Special		

René Thomas Feted in Paris

PARIS, June 13—French enthusiasm ran riot when René Thomas and his teammates entered Paris after their victory at Indianapolis. Racing fans packed the inside and outside of Gare St. Lazare to such an extent that special police had to be called up to handle the crowds. Louis Delage, builder and owner of the winning car, accompanied by Madame Delage and by M. Michelat, chief engineer of the Delage company, headed the deputation. Flowers were presented, flags were waved, and men and women alike struggled to kiss the somewhat bashful and embarrassed Thomas. The new Delage racing car for the French Grand Prix next month had been driven to the depot by Bablot, and it was in this machine that Thomas was given a triumphal joy ride through Paris to the showrooms of the Delage company, where champagne flowed freely and speeches were indulged in.

All the drivers who took part in the Indianapolis race are enthusiastic over their reception and the manner in which they were treated in America. Without an exception they declare their intention of coming to Indianapolis next year.

Colorado to Salt Lake Run for August

DENVER, COL., June 25—The formal opening of the Colorado-Utah stretch of the Pike's Peak Ocean to Ocean Highway will be celebrated this summer by a 650-mile endurance and reliability run from Colorado Springs to Salt Lake City. Another run of the same kind and same distance is also being planned from St. Joseph to Colorado Springs, which is the midway point of this 1,300-mile route between St. Joseph and Salt Lake City.

Milwaukee Interclub Reliability Award Reversed

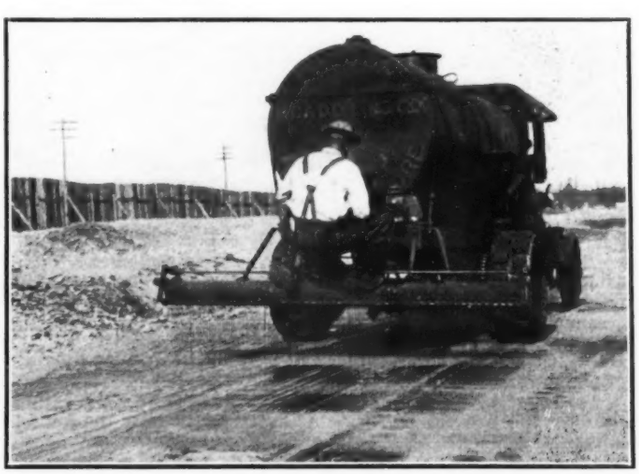
MILWAUKEE, WIS., June 27—A review of proceedings under a protest made by the contest board of the Milwaukee Athletic club has resulted in the award of the Wisconsin Motorist trophy to the Athletic club instead of to the Milwaukee Automobile Club as winner of the second annual interclub reliability to Fort Atkinson, Wis., and return on Saturday, June 20. The motor club won the plaque in the first tour in 1913 and on the face of the returns of last Saturday's run was again named winner, but evidence was dug up by the losers that several observers were negligent and the judges made a new canvass of scores, with the result that the motor club lost by a score of 44 to 2. The original score gave the motor club a victory by a score of 50 to 34.

The Athletic club was penalized originally a total of 50 points by reason of the killing of a duck by No. 14, Cadillac, Robert E. Hackett. Evidence was adduced that a motor club contestant had injured a chicken, but neither driver nor observer were aware of the fact and it was not reported. An athletic club car just behind the offender noted the violation of the rule. This canceled the 50 points against the Athletic club.

First American Cyclecar Reliability Run

NEWARK, N. J., June 26—The Cyclecar Club of New Jersey will hold the first Cyclecar Reliability Tour in America on September 2, 7, and 8, when a 300-mile tour from Newark to Atlantic City via Philadelphia, will be made. A schedule of 20 miles an hour will be enforced with ample checking stations and noon and night controls. Every car will carry an official observer and a close tally on tires and gasoline consumption in each class will be given. Twelve silver cups will be given as prizes to the perfect score cars.

SYRACUSE, N. Y., June 27—M. Burton Coe won the silver trophy in the annual run of the Automobile Club of Syracuse, June 24. The secret time decided upon for the run to Mexico Point was 2 hours and 19 minutes, and Mr. Coe's time was within 1 minute and 2 seconds of being correct. Edward W. Sparkes was the successful contestant for the Watson cup, the four winners of this trophy for the past 4 years fighting it out for permanent possession of the trophy. Sixty-seven cars took part.



Huge oil-sprinkler mounted on motor truck for Sioux City track

Poor Space for U. S. at Paris Show

Under New Rules Only Members of I. U. A. M. Get French Privileges—U. S. Not Asked to Join

PARIS, June 20—American automobile manufacturers are given the alternative of either keeping out of the Paris Salon or accepting third-rate stands under the gallery. Under the new regulations only nations belonging to the International Union of Automobile Mfrs. are allowed to have the same positions as French firms, and on condition that the firm has exhibited in three previous Paris shows. Practically every European country is represented on the International Union of Automobile Manufacturers; thus European firms draw lots for positions at the same time as the French if they have exhibited three times previously, or just after the French if they have not been in the show this number of times. This enables all Europeans to get front row stands in the Grand Palais. America has never been represented on the International Union and is therefore barred from all the better stands.

R. N. Goode, general manager of the Paris branch of the Packard Motor Car Co., declares that rather than accept an inferior stand he will keep out of the Paris show. Last year the Packard company had a big stand in the center of the hall.

F. O. Bezner, vice-president of the Hudson Motor Car Co., sees no hardship in the new arrangement. "Last year we had No. 1 stand," Mr. Bezner stated to THE AUTOMOBILE representative, "which was really better than we could ever have hoped to obtain. This year all the American firms will be grouped. In my opinion this is a decided advantage, for it will help to draw attention to American cars. We have always been well treated by the Paris committee, and I am personally very well satisfied with the arrangement to group us in a second or third rate zone. Every firm in the show gets a big amount of publicity, and if we spend the difference between the cheap and the dear stand in newspaper advertising, we shall get just as much out of the show as the man who has No. 1 stand on No. 1 row."

It is now officially announced that the show will open on October 16 and close on October 26. President Poincare recently received Louis Renault, as head of the show committee, and assured him that he would officially inaugurate the show on the morning of October 16. In addition to passenger cars, the Paris show provides classes for commercial vehicles, motorcycles, cycles, steel and foundry industries, and automobile publications. The Grand Palais will be made use of as on previous years, with a special building for commercial vehicles, if necessary. Applications for space in the exhibition hall are received until July 10. This year's show is under the control of a joint committee representing the various French trade associations, and is conducted on a profit sharing basis. Foreign firms are allowed to share in the profits, but can only secure the highest percentage by obtaining membership in one of the French associations.

C. of C. Willing To Take Space

NEW YORK CITY, July 1—Alfred Reeves, general manager of the National Automobile Chamber of Commerce, when informed of this latest ruling on the Paris show stated:

"Our makers and our organization will gladly take any necessary steps to become members of the N. U. A. M. and will go further and agree on space for all our members, the same as we do at New York shows for all importers. We have not been approached to join the International Union."

105 M. P. H. in Grand Prix Trials

PARIS, June 20—Official trials over the French Grand Prix course were carried out four mornings this week from 3 to 5 o'clock. The course is now closed to all racing cars and will not be opened until the day of the race, July 4. It is evident from the results obtained in the trials that the 1914 French Grand Prix will be the most keenly contested automobile race ever held in Europe. There are forty-one cars of fourteen different makes, representing France, England, Germany, Italy, Belgium and Switzerland. Elaborate precautions are being taken to prevent racing secrets leaking out. The Mercedes cars are housed in a completely enclosed stone garage, with an 8-foot brick wall around it. One guardian sleeps inside and another outside the garage, while as a final precaution a heavy chain is padlocked round the bonnet when the cars are not in service.

In the trials the Delage men made laps in 23 to 24 minutes. The course measures 23.3 miles and is of a very varied nature—winding, hilly, and fast and straight. The Peugeots showed about the same speed. Mercedes did faster work, Lautenschlager going round the course in 20 minutes, and Salzer doing a lap in 19 minutes. Fiat averaged about 24 minutes and Opel was only slightly slower. Jean Chassagne did not attempt any fast work with his English Sunbeam. The drivers of the two Piccard-Pictet cars, fitted with single sleeve motor, were more interested in doing consumption tests and learning the intricacies of the course than in attaining the highest speed. On certain portions of the course a speed of 105 miles an hour was attained by Delage, Mercedes and Peugeot. Owing to the difficulties of other portions of the course, the average speed is not likely to be much above 70 miles an hour. Total distance for the race is 467.6 miles, and cars are restricted to a cylinder area of 274.6 cubic inches.

Saxon Transcontinental Car Reaches Ely, Nev.

NEW YORK CITY, July 1—The Saxon car, traveling from this city to San Francisco, Cal., reached Ely, Nev., yesterday, after a 156-mile run. The car averaged around 30 miles to the gallon and is adhering to its schedule.

Detroit Electric Breaks Phila.-Boston Record

PHILADELPHIA, June 29—R. L. Heberling, of the Philadelphia Storage Battery Co., conducted an electric trip from Boston to Philadelphia last week during which a new record was made. A Detroit Electric was used. The time between Boston and Philadelphia was 33 hours 50 minutes elapsed time, and only 14 hours 37 minutes actual time, making an average of 25.4 miles an hour.

Master Carbureter Corp. Organized

DETROIT, MICH., June 27—The Master Carbureter Corp. has been organized in Detroit with a capital stock of $250,000 under the laws of Delaware with offices at 944 Woodward avenue. W. E. Burk, president of the Master Carburetor Co., Los Angeles, will reside in Detroit as vice-president and general manager of the new corporation, while W. W. Jenkins, formerly general manager of the Pacific Coast company, will act as general sales manager. The Detroit corporation is entirely independent from the Los Angeles company and has manufacturing facilties for 250 carbureters per day.

Paris fêting Thomas, Indianapolis winner, in Grand Prix Delage

Claims That Makers' Instruction Books Mislead Car Owners

The Automobile Engineers' Forum

Thinks Statements of Care Required for Car Are Exaggerated, Appall the Owner and Result in Neglect in Lubricating the Various Parts

NEW YORK CITY—Editor THE AUTOMOBILE:—In giving directions to owners for the care and especially the lubrication of their cars, manufacturers have almost universally made the mistake of exaggerating the importance of lubricating certain parts and of stating that these parts should be lubricated oftener than is actually necessary.

The purpose of exaggerating, it seems, is to make sure that the owner will not neglect his car, but the directions laid down in the ordinary instruction book are so preposterous that, instead of scaring the owner into lubricating and cleaning his car every few days, he is liable to do just the opposite. By overstating, the manufacturers evidently plan that, at best, a man will not follow the instructions exactly. If the book says the wheel bearings should be lubricated every 800 miles, then he will do it about every 1,500 and if it states that the oil in the motor should be changed every week it will not be done more than once in 2 weeks, or if it says the body should be washed without the use of hot water, soap and a hose the owner will compromise by using cold water and rather weak soap.

Makers' Requirements Too Exacting

But the manufacturers' requirements are so exacting and so different from ordinary practice throughout the country that when the owner receives his machine, instead of trying to follow the instructions given, he gives it up as a hopeless task. The owner realizes if these instructions were taken literally that life would become a burden—not at all what this same maker's catalogue pictured it to be, and the advice of the agent that sold him the car and the advice of his friends all contradict the teachings of the instruction book. Thus the car owner decides that the book is not to be relied upon since his friends' cars are running all right and they do not do all the things required by the makers.

Recently I have had the pleasure of examining several of these books and I found, on the average, that it was necessary to lubricate wheel bearings every 500 to 800 miles, that it was necessary to put grease in the steering gear housing every 300 miles, that the sediment chamber on the carbureter must be drained every 200 miles, that the rims should be graphited to keep them from sticking every 1,000 miles, that after every run the cuts in the tires should be filled, that the various grease cups around the car should be turned every 100 miles and so on.

Owner Ignores Instructions

If the owner followed all these instructions out to the letter he would be crazy in about one week. Instead, he forgets about the instructions and uses his own poor judgment in caring for his car or else he takes the advice of some friend that knows no more about it than he does. The result is that the car is neglected.

It would seem much better, in the light of practical experience, for the makers to be honest about these matters, to state just exactly when the pump shaft grease cups should be refilled and exactly when new oil should be put in the motor, etc. If this policy were adopted the owner would only be too glad to follow the instructions given, he would have confidence in the advice given and his car, instead of being neglected would get the attention it should receive.—M. T. S.

Suggests Making Place for License Plate a Part of Design

BROOKLYN, N. Y.—Editor THE AUTOMOBILE:—Standardization of number plates is a matter that has not received the attention that it should, up to the present time.

There is much to be said in favor of the standardized number plate. In the first place, it would be easier to install or to change the plates when passing into another state. Since the plates would all be the same size, better arrangements could be made for fastening the plates more securely, and at the same time the fastening could be so designed that they could be more easily detached.

A further step would be to make special provision in the design of the car body for the incorporation of the number plates and this would add to the appearance of the car. For instance, a place could be made in the rear panel, for the rear plate and the front plate could be placed at the base of the radiator in a frame that would almost make the plate part of the radiator.

In standardizing, provision should be made for two sizes of plates, one for large cars and the other for cyclecars, as the large plates now used on cyclecars look grotesque. In many cases the front plate is wider than the entire hood.—F. P. W.

Recommends Dimming or Extinguishing of Left Headlight

PHILADELPHIA, PA.—Editor THE AUTOMOBILE:—It would seem to me that the solution of the headlight glare problem lies in passing laws requiring that motorists turn out, or dim, the left headlight when approaching another car. Since the majority of cars are now steered from the left, it is the rays from the left lamp of the oncoming car that blind the operator and by turning this light out this trouble would be overcome.

The position of the headlight rays of two approaching cars, with all headlights burning, and with the left ones turned out, is shown in Fig. 1. Here it will be noted that

with the left headlight lit the drivers do not pass out of the influence of the lights until they are almost past, and then it is too late to avoid an accident. However, when the left headlight is turned off the driver passes out of the focus of this light 50 to 75 feet before away from the other car.

This method is superior to using a headlight dimmer because the latter reduces the brilliancy of illumination to such an extent, and so suddenly, that for the moment it is harder to see than before, the eyes being accustomed to the brilliant light, the pupils can not distend quickly enough to enable clear vision when the lights are suddenly dimmed on the approach of another machine.

The question of glaring headlights has become especially acute since left drive has become common, as with right drive the operator passed out of the influence of the left headlight long before the cars passed each other, and therefore some such scheme as I have suggested should be adopted to overcome this evil.—J. T. L.

DETROIT, MICH.—Editor THE AUTOMOBILE:—A means of controlling the cooling of the water in the radiator would be a great advantage.

This is plainly illustrated by the fact that nearly every one resorts to a piece of newspaper or cardboard to be placed over a part of the front of the radiator in extremely cold weather. It also illustrates that a control would not be abused, inasmuch as the practice of closing off the radiator with a piece of paper has not resulted in any complications or difficulties. It would seem that some means of varying the exposed cooling surface, which could be controlled from the seat, would be very desirable and certainly would assist running of the cars in cold weather. In fact, we have foreseen this to the extent of taking out a patent on such a construction some 2 years ago.—GEORGE W. DUNHAM, Vice-president and Consulting Engineer, Chalmers Motor Co.

Finds Reliners Best for Medium-Priced and Undersized Casings

ERIE, PA.—Editor THE AUTOMOBILE:—Our reliners fit all sizes of casing from 28 by 2.5 up to and including 37 by 5 inches. We are using a special fabric in the manufacture of these reliners, which we have adopted especially for this purpose.

We recommend using reliners in casings where the fabric has been injured, also in medium-priced or undersized casings; if tires are oversized, we do not recommend putting in reliners. If used in medium-priced and undersized casings, they will enable the owner of the car to use his casing much longer and will give a large amount of extra mileage.

It is our opinion that the use of reliners saves the car owner a great deal of tire expense, for, as stated above, it prolongs the life of his casing and gives extra service and mileage, at a very small additional expense. We are of the opinion that the sale of reliners is going to show a big increase the coming year over previous years and we strongly recommend them to car owners for practical use.—CONTINENTAL RUBBER WORKS.

Increased Mileage Secured from Old Tires by Inner Liners

BATAVIA, N. Y.—Editor THE AUTOMOBILE:—We make interliners to correspond with the inside of the casing with which it is intended to be used. The material used is friction fabric vulcanized by gum.

We advise the use of liners in old casings only as the applying of liners in new casings is detrimental, both to the casing and to the inner tube. We would not advise the owner of a new tire to use interliners, from the fact that there is sufficient fabric in a first-quality tire to take care of the air pressure necessary to have the tire properly inflated, and an interliner is not at all necessary.

An increased mileage, in our judgment, can be secured from a tire that is badly worn and fabric broken by using interliner, giving quite a considerable additional mileage under those circumstances, well worth the expense of the equipment.

The demand for interliners is mostly on small tires, owing to the fact that the larger tires are used on a more expensive class of cars where the owners will not bother with interliners.—A. W. CANEY, President Batavia Rubber Co.

Thinks Inner Liners Decrease Mileage of New Tires

MILWAUKEE, WIS.—Editor THE AUTOMOBILE:—We are manufacturing reliners for practically all sizes of automobile casings from 28 by 3 to 38 by 5 inches. Reliners for each of the different sizes are built so as to permit a short lapping of the ends when the reliner is inserted in the casing and the width is sufficient to bring the edges of the reliner below the rim contact point and above the toe of the casing.

We are using only high grade fabrics of a consistent tensile strength which is sufficient to prevent the tube from blowing through the reliner even though the casing may be worn or torn so that the reliner itself is exposed.

We do not recommend the use of reliners in new tires. The use of reliners is advisable only to prolong the life of worn casings and is a sort of reinforcement in the case of worn and broken fabric where the motorist does not feel that he has had sufficient mileage from his tire to warrant the expenditure of the price of new tires. Used in new tires the friction necessarily resulting is only harmful to the carcass of the tire and a decreased mileage is bound to result. No matter how carefully reliners may be applied or how skilfully they may be cemented to the inside of new casings the union between the reliner and the fabric of the casing is such that heat is bound to generate and damage result. While it is difficult to determine just what effect the use of reliners has on new casings, we believe that the experience of all tire manufacturers is the same and that if the tire manufacturer felt that the additional plies of fabric in the casing were beneficial to the general result he would adopt a tire built with extra plies of fabric to take the place of the reliner in all casings.

We make no claims for increased mileage in the use of our reliners. The condition of the casing at the time the reliner is applied will have much to do with the mileage resulting from the use of reliners. As a matter of fact, any attempt to make definite claims regarding mileage resulting from the use of reliners is out of the question and statements regarding mileage results obtained are usually visionary rather than real.—FEDERAL RUBBER MFG. CO.

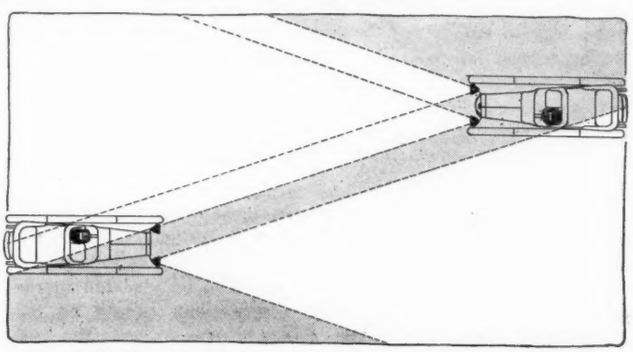


Fig. 1—Illustrating one method of overcoming headlight glare, by dimming or extinguishing left headlight

The Rostrum

Believes in Small Bore, Long Stroke Two-Cycle Motor

EDITOR THE AUTOMOBILE:—I note with interest that a number of your readers are favoring the two-cycle motor for automobiles, and I wish also to add a few words in favor of the discarded two-cycle motor.

I have a four-cylinder, two-cycle Elmore engine with cylinder compression and rotary valves.

A few days ago I made a trip of 113.5 miles, and before starting on this trip I measured my gasoline, and after arriving home found that the gasoline consumption was 8.67 gallons, or 13.09 miles per gallon.

My car weighs 2,400 lbs. and most of the mileage was between Greensboro and Lexington and from Lexington to High Point, and no doubt many of your readers have been over the National Highway from Greensboro to Atlanta, and if so will agree that the roads around Lexington are about as hilly and trying as any between Greensboro and Atlanta.

The writer is no engineer, but it seems that if an engine of this type were properly developed, a smaller bore and longer stroke used, that better results would be obtained. This type of Elmore engine has a bore of 4 inches and stroke of 3 1-2 inches, and if the bore were 3 3-4 inches and the stroke 4 1-2 inches with the cylinders offset slightly, the proper amount of compression in the lower half of the cylinder determined, an engine would be produced that would have ample power for a 2,400 to 2,600-pound car, and the gasoline economy would be better on account of the greater expansion of the gases.

Another improvement would be to increase the compression somewhat and have the gear ratio of 3.69 to 1 increased to 4 to 1, or possibly a little greater.

You will understand that this type of engine is not suitable for a racing car, but for all around work ideal results could be obtained, as a four cylinder two cycle engine is as flexible as a light six, will run with less vibration and avoid all valve troubles. I hope that some American manufacturer will develop the two-cycle engine as the French manufacturers appear to be doing, as there are possibilities in the two-cycle engine which have never been touched.

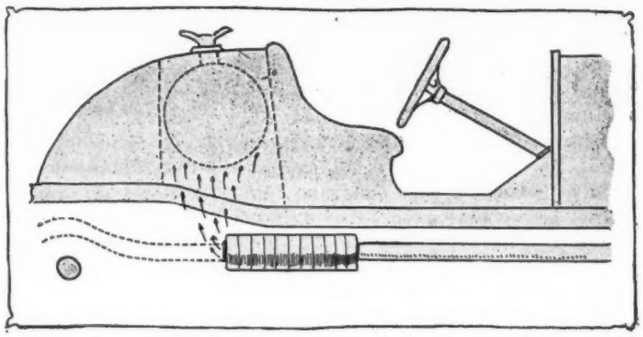


Fig. 1—How broken tail pipe caused fuel to boil and motor to miss

We all know what the Diesel engine is doing in stationary engine work, beating all types of engines for economy and thermal efficiency.

Another matter that would need developing with the two cycle engine, would be efficient carbureters. Practically no carbureters on the market today are entirely suited to two-cycle engines when used in automobile work, as the gasoline supply of the two-cycle engine should be decreased slightly as the engine speed increases, on account of the fact that when the engine is running partly throttled a smaller charge is admitted to the cylinders and more burnt gases are trapped than when running with a wider opening of the throttle.

I believe that there is one, possibly two French carbureters made to work on this principle, the wider the throttle is opened the smaller opening the needle valve has, but I do not know of a single American-made carbureter that works on this principle. The Schebler Model D is made with one jet and auxiliary air supply controlled with a coiled spring, and the Planhard has a ball controlled air supply with one jet, and very good results can be obtained with either carbureter, but until there is a larger demand for a carbureter that will give the two-cycle engine more flexibility than is usual in marine work, no particular attention will be given to the development of the perfect carbureter for two-cycle engine work, and ideal results will not be obtained.

Randleman, N. C. R. P. DEAL.

Wiring Lights to Ford Magneto

Editor THE AUTOMOBILE:—1—Will you please publish a diagram showing how to install a low-priced electric lighting outfit operated by the magneto on a Ford 1913 touring car? Where are the wires to be connected for installation?

2—Where can this outfit be purchased?

Allendale, N. J. W. C. TALMAN.

—1—In using the magneto for lighting purposes it is only necessary to run wires from the terminal on the top of the motor to the lamps, the return connection from the lamps being grounded. If the lamps are to be arranged in series, 6-volt lamps should be used and they should be wired up as shown at the top in Fig. 2, while if the parallel arrangement is used the wiring should be as shown at the bottom and 12-volt lamps will be required.

The complete outfit for such an installation can be purchased at almost any supply store for a few dollars together with the necessary switch, bulbs, wire, and reflectors for insertion. The reflectors are arranged to be inserted in the acetylene headlights. Detailed instructions should be obtained from the concern that manufactures or sells the system that you select.

2—If your accessory dealer cannot supply you you can obtain one from the American Auto Supply Co., Chicago, Ill., whose outfit, with kick switch, sells for $3.95; Emil Grossman, New York City, makes an outfit that is listed at $3.45 with 8-inch reflectors; the Fitzgerald Mfg. Co., Torrington, Conn., manufactures an outfit that consists of two brass reflectors, silver plated, a detachable handle switch, Ediswan sockets, oil-proof, cable-cut to the correct lengths; the Excelsior General Supplies Co., Chicago, whose outfit is listed at $7.50, as is that of the R. C. Hull Electric Co., Cleveland, O., and the Auto Parts Co., Providence, R. I., which lists a similar outfit at $3.50; the Motor Car Equipment Co., New York, at $8.50, and the K-W Electric Co., Cleveland, O., at $15, including complete lamps.

Lighting outfits are made in three types by the Vesta Accumulator Co., Chicago. These range in price from $3.80 to $13.50. The two cheaper ones include reflectors for the gas headlights together with the necessary bulbs, wire, switch, etc., ready to install. The $13.50 outfit has a pair of acorn type electric headlights equipped with bayonet lock connectors.

A new Ford lighting outfit involving a patented reflector is marketed by the A. H. Kling Co., Detroit, Mich. These

reflectors are silver-plated brass instead of steel, but the special feature is that the back of the reflector is removable so that it is unnecesary to remove the entire reflector in replacing burned-out bulbs. Ease of installation is assured by a complete wiring harness. The outfit, including a flush switch, costs $5, with $1 extra for an Ediswan base tungsten bulb. The Gibson Automobile Co., Indianapolis, Ind., supplies a magneto lighting system with special headlights at $14 and outfits without headlights, but with the parabolic reflectors, from $10 to $17. Some of these comprise the Gibson regulating switch, a $5 instrument.

A complete outfit designed to be installed at small cost is made by E. A. Hammer Co., Cleveland, O. Two types of magneto lighting systems are made by the Auto Parts Co., Chicago. One system is listed at $4.30, the usual outfit of bulbs, wiring and reflectors are supplied, while in the other one listing at $14.40 special bullet type headlights are supplied.

To Keep the Headlight Bulbs from Burning Out

There is one difficulty that is met with in using the magneto as a source of current for the headlights, and that is that the magneto, being designed for ignition only has the property of generating higher voltage as the speed increases so that above 30 or 35 miles per hour the lamps often burn out. It is true also that at low speeds the magneto does not generate sufficient current to make the lamps brilliant. To get around this difficulty there have been one or two regulating devices put on the market which are intended to prevent the excess of current going to the lamps at high speed.

These devices not only prevent the burning out of the lamps, but also permit bulbs of slightly lower voltage to be used so that a good driving light may be had at lower speeds than is possible without them. One of these is the Dean regulite, which inserts a resistance to the current as soon as, and only when, the engine speed and the consequent voltage becomes too high for the lamps. The regulite provides three steps or degrees of action, thereby adapting it to generators of varying capacity. It is made by the Dean Auto Devices Co., Chicago, and is marketed by the Fulton-McCutchan Co., Chicago. An auxiliary which can be obtained in connection with the regulite switch is the Dean speedolite, which is a dash lamp that illuminates the speedometer and acts as a warning should anything go wrong with the regular lighting system. It is supplied at an additional cost of $1.50.

Regulite Has Choke Coil

A similar regulator is the Lite-Controller. The device embodies a choke coil, which generates sufficient back pressure to prevent the light from burning out. Three steps are provided. It is sold at $3 and is manufactured by the American Battery Co., Chicago. Another regulator of this type is made by D. W. McVean, Noblesville, Ind. This, it is claimed, gives a good light at 5 miles per hour, and may be installed by anyone in 30 minutes and sells for $1.50. To reduce the brilliancy of the light for city driving, the Post & Lester Co., Hartford, Conn., is making a controller known as the Dim-Down. It is operated by the driver's foot and lists at $3. A small instrument designed to dim or brighten the headlights is announced by the Suburban Lighting & Gas Engine Co., Toledo, O., under the name of Dimit. The device itself may be placed on the dash and is controlled by hand. The face of the instrument is fitted with a switch and various notches so that the headlights may be operated at full voltage or at intermediate pressure. It is especially applicable to Ford cars and sells for $2.50.

Ford magnetos generate alternating current and for this reason storage batteries cannot be used in connection with them unless some means for changing alternating into direct current is employed. A rectifier for this purpose is manufactured by the American Battery Co., Chicago.

Boiling Gasoline Makes Motor Miss

Editor THE AUTOMOBILE:—A missing motor that was caused by the boiling of the gasoline was a trouble that I had recently and yet if I had not experienced this trouble myself I would not have believed it possible. Since then I have found one other case like it and although this trouble will not visit very many owners it is so difficult to locate when it does occur that a description of my experience should prove of value to some of the readers of THE AUTOMOBILE.

The trouble was all due to the breaking of the muffler tail pipe which allowed the gas to pass directly around the fuel tank. This is clearly illustrated in Fig. 1. The rear of the car is equipped with a turtle deck and the gasoline tank is located right back of the seats and in front of a compartment for tools. The bottom of the space the tank is in, is open, and the top is not air-tight although it is covered over. There is no filler cap on the tank but there is a cover in the top of the turtle deck right close to the opening in the tank. The result was that when the tailpipe was broken off by a blow from the axle, when going over a very severe bump, the gas issuing from the muffler passed around the tank and up through the filler opening and out. Hence after running a few miles, especially on a hot day, the gasoline would boil.

When the tail pipe broke, I left it off for the reason that it did not seem to be of any use and it certainly did not make any difference in the amount of noise the motor made. After that, however, the car would develop symptoms of overheating after running a few miles. The motor would miss, the car would run hard, would not develop its full power and would therefore not climb the hills as it should. It would not run at all below 15 miles per hour on high gear.

Everything seemed to be all right. I noted, however, on stopping for lunch one day that the car ran much better after this rest.

Later, after running the car a few miles in the hot sun, I found it almost impossible to proceed. I stopped the car in a hopeless effort to find out what the matter was. With the noise of the car and engine hushed, I heard a bubbling sound coming from in back of the seats. I turned around wondering what the trouble was, pulled off the filler cap and found that the gasoline was boiling briskly.

A little thought showed what was causing the trouble and I got a large piece of sheet iron and tacked it on the under side of the body in such a way as to deflect the gases to the

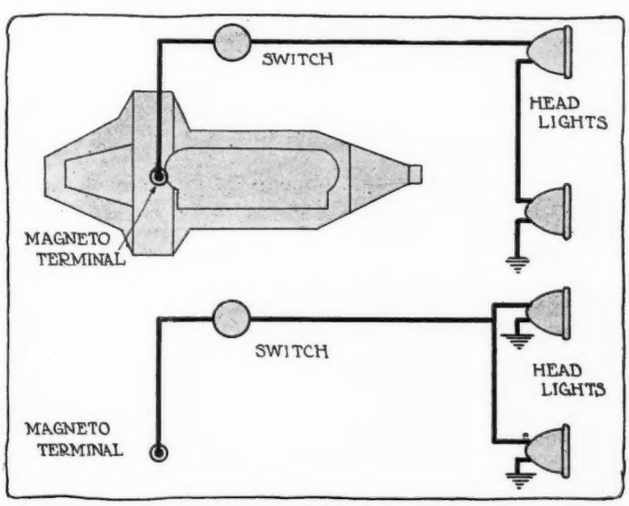


Fig. 2—Upper—Series method of wiring headlights to Ford magneto. Lower—Parallel method

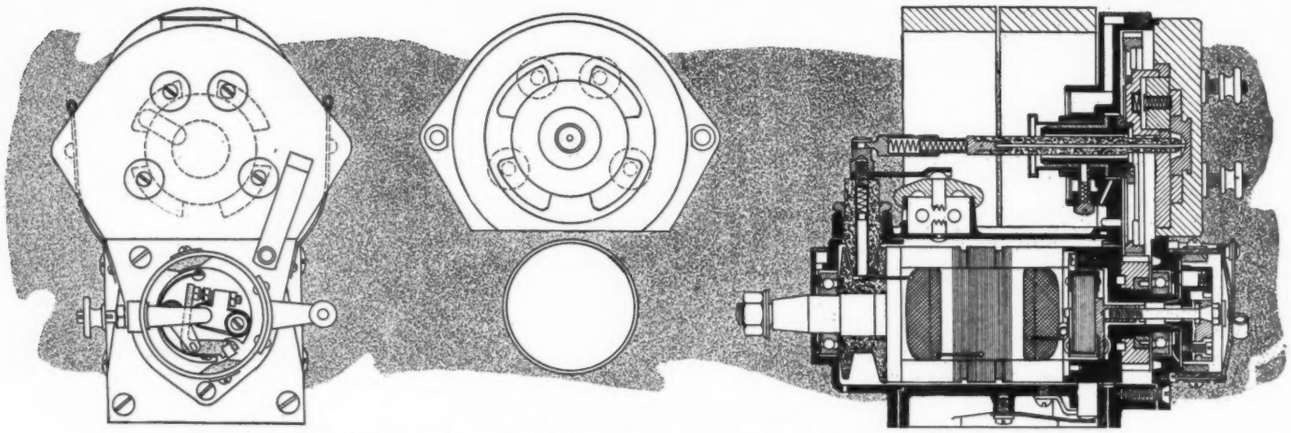


Fig. 3—Front and read, and longitudinal section of magneto showing construction of mechanism

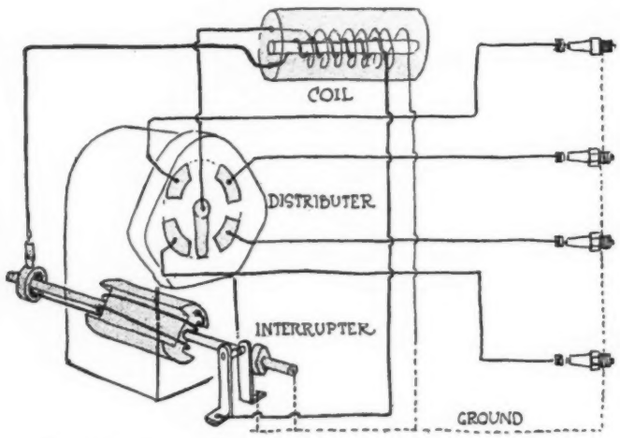


Fig. 4—Diagram showing working of low-tension magneto

rear, and I was troubled no more, the engine running perfectly.

Since then I met another owner that had the same trouble due to the gasoline pipe being close to the exhaust pipe for several inches. As soon as the fuel reached this hot place it would turn into vapor and the motor would miss and sometimes stop.

New York City. R. F. C.

Details of Magneto Construction

Editor THE AUTOMOBILE:—1—Please name each part of the magneto ignition system, and show the construction of each part.

2—What changes take place in the magneto and engine, when the spark is advanced and when it is retarded?

Beaver Falls, Pa. E. S.

—1—Before attempting to name the functions of the different parts of a magneto ignition system, it will be necessary to explain the principle on which the magneto operates.

A magneto is a device that furnishes a spark at the points of the spark plug when the piston is somewhere in the neighborhood of top dead center, between the compression and power strokes, the spark being generated by the rotation of a member called the armature. The spark produced in the armature is of low voltage and must have its voltage raised to enable it to jump the gap of the spark plug. This is accomplished in a coil which may be located right on the armature, or separately from the magneto. In the former case the magneto is known as a high-tension magneto and in the latter a low-tension magneto.

The spark generated in the armature is correctly timed by a device in circuit with the armature circuit which is known as a breaker and which is nothing more than a switch that is operated by a cam on the armature shaft.

The high-tension current as it leaves the coil is switched to the proper cylinder by a distributer.

The two types of magnetos, low and high-tension, are illustrated in Figs. 4 and 5. Turning first to the low-tension type, the current is generated by the rotation of the armature between the horseshoe magnets. The armature consists of a piece of soft iron, shaped somewhat as shown, with a few turns of copper wire around it, as indicated. Since the armature is between the ends of a magnet, it is thoroughly saturated with magnetism. Now when the armature is rotated, the turns of copper wire in the coil cut through this magnetism with the result that an electric current is set up in the windings. The iron of the armature is merely for the purpose of concentrating the magnetism so that the strength of the magnetic field through which the coil rotates is at a maximum. The denser the field the greater the voltage produced in the coil.

When the current is generated it passes through the collector ring and brush at the rear of the armature, up to the coil, where it runs through the low-tension or low-voltage winding of the coil. From thence it passes down through the breaker or interrupter back to the armature again. Ordinarily the interrupter is closed, but when the piston nears the top of the compression stroke and it becomes time for a spark to occur to ignite the charge, the interrupter cam on the armature shaft separates the points of the interrupter or breaker, thus breaking the circuit and interrupting the flow of current. This sudden interruption of the current flow produces a current of very high voltage in the secondary or high-tension winding of the coil, the latter winding being directly outside of the primary. This high-voltage current flows to the spark plug and jumps the gap and thus a spark is produced.

The high-voltage current, produced in the secondary, is diverted to the proper cylinder by a device called a distributer, as previously stated. This consists of a rotating brush that is connected to one end of the high-tension coil. This brush makes contact, one at a time, with four metal segments, 90 degrees apart, each of these segments being connected to a spark plug by means of a high-tension wire.

When the current jumps across the gap of the spark plug it passes through the engine and frame back to the coil, in other words, the return circuit is grounded.

A spark is produced for every half revolution of the armature, therefore in a four-cylinder motor the armature should be run at crankshaft speed, since a spark is required four times in two revolutions or once every half revolution.

The distributer on the other hand should be driven at half crankshaft or camshaft speed for the reason that the brush makes contact with four segments every revolution, there-

fore if it makes one revolution for every two of the motor, it will distribute the four sparks that are required every two revolutions of the motor.

The distributer shaft must not only run at half the speed of the armature shaft, but the two must also be connected up so that when the breaker points on the distributer separate and the current is thus induced in the secondary winding of the coil, the brush will be on the proper distributer segment.

The high-tension magneto is similar to the low-tension one with the exception already noted, that the coil is located on the armature. In this case, the low-tension winding of the coil takes the place of the armature winding and it is in this that the current is generated. The circuit is broken by the breaker just the same as in the low-tension type and then the high-voltage current is produced in the high-tension winding of the coil, this coil being outside the primary coil and on the armature.

From the high-tension winding of the coil, the current is directed to the distributer through the brush and collector ring and from thence it is distributed the same as in the low-tension system.

Now that a general idea of the principles of a magneto has been obtained the construction of a well-known high-tension magneto will be described. There are so many parts to a magneto, however, that it is impossible to name all the different members but merely the principal ones. For the same reason, it is impossible to illustrate more than the one magneto.

Figs. 3 and 6 show the construction of a high-tension magneto. Fig. 3 shows a front view and a longitudinal section and in Fig. 6 cross sections at various points from front to back are shown. The first view shows the complete magneto as seen from the driving end, and then follows sections four sections and then a rear view with and without the distributer cap.

The principal parts are named and if the principles of operation of the high-tension magneto are understood, there should be no difficulty in comprehending the functions of the different parts on this magneto.

The current is generated in the armature low-tension winding from whence it is carried to the breaker. At the proper moment, the points of the breaker are separated and the circuit is broken, the parting of the points being accomplished by means of one of the cams depressing the bell crank arm of the breaker.

When the high-tension current comes from the armature it is picked up by the carbon brush which is in contact with the slip ring on the armature shaft. From thence the current passes to the distributer brush through the long current conductor and then it is passed to the spark plugs.

Above the armature, there is a safety spark gap so that in case one of the wires leading to a spark plug is disconnected while the motor is in operation, the spark will jump across these points and thus no injury to the armature will occur. Without a gap the insulation would break down.

2—When the position of the spark lever is changed, the time at which the spark occurs in the cylinder is also changed. For example, if the lever is retarded all the way, then the explosion will probably occur a little after the piston passes top dead center or after it has started on the explosion stroke. Some time after the spark occurs, the charge is burned and maximum pressure is developed. Thus, the further the spark is retarded the later, on the explosion stroke, is maximum pressure generated, and combustion completed, with the result that the full expansive force of the gas cannot be utilized, and furthermore, when combustion is occurring, more of the cylinder space is exposed by the piston because the piston has partly completed the out-stroke and this causes overheating.

Now if the spark lever is advanced, the spark will occur before the piston reaches dead center, and if the lever is advanced all the way the spark may occur so far ahead of dead center that maximum pressure will be generated before the piston reaches the top of the stroke with the result that the pressure of the explosion will actually be working against the upward movement of the piston. This causes a loss of power and a knock.

Of course, these remarks only apply providing the magneto is correctly timed.

The ideal condition is to have the spark lever in such a position that the full force of the explosion will take place just after the piston reaches top dead center. In this way the full expansive force of the gas can be utilized and there is no knocking, which might be caused by an early spark nor any overheating, which might be due by a late spark.

The time at which the spark takes place may be changed in three ways, by rotating the breaker box housing so that the position of the cam with reference to the breaker arm is changed, see Fig. 3, by means of a helically cut sleeve inserted in the armature shaft and in this manner changing the position of the whole armature with reference to the motor; and by rotating the magneto housing and thus changing the relative position of the cam and breaker mechanism.

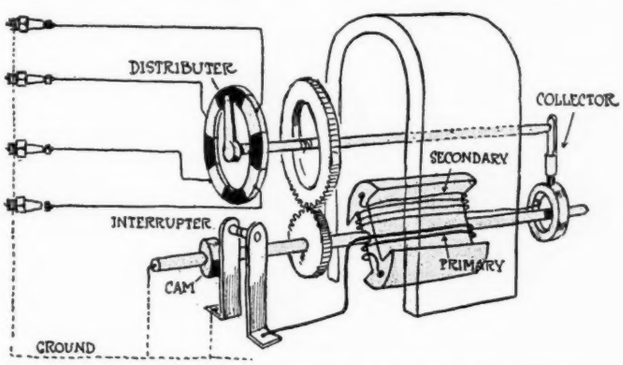


Fig. 5—Diagram showing operation of high-tension magneto

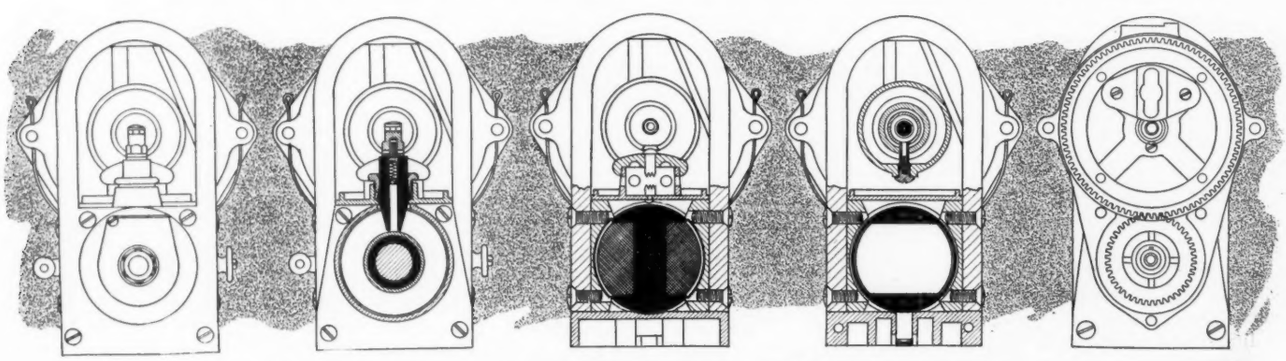
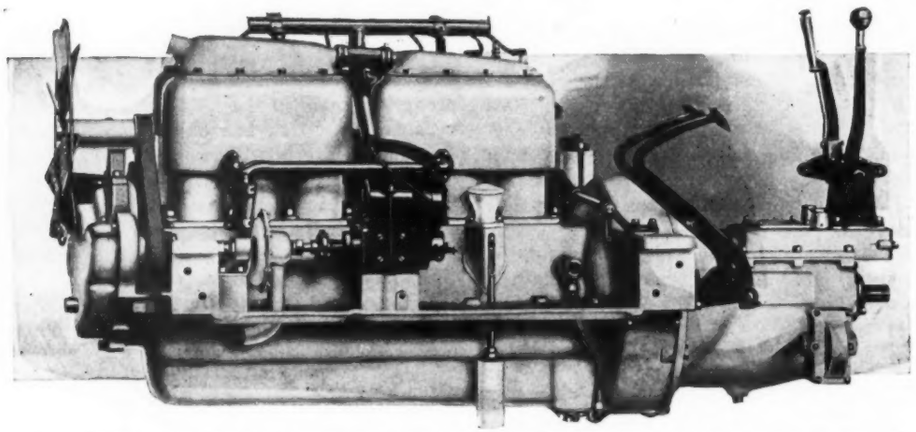


Fig. 6—Sectional views through magneto showing the construction at various points

Chandler 2,885-Pound Six Has 10 Per Cent. Power Increase



Six-cylinder motor cast in threes used on the 1915 Chandler six. A silent chain is used to drive the auxiliary shafts

Engineers Have Added to Power Output Without Increasing Bore or Stroke —Silent Chain Camshaft Drive—Two Piston Rings Per Cylinder Instead of Three—Price $200 Lower

WITH the price clipped from $1,785 to $1,595 and with its motor refined to such an extent that 10 per cent. has been added to the power, the 1915 Chandler six has just made its début. The new product of the Chandler Motor Car Co., Cleveland, presents much the same general appearance as did the 1914 model, although several refinements have made it an even better car than its predecessor, despite the fact that its price is considerably less.

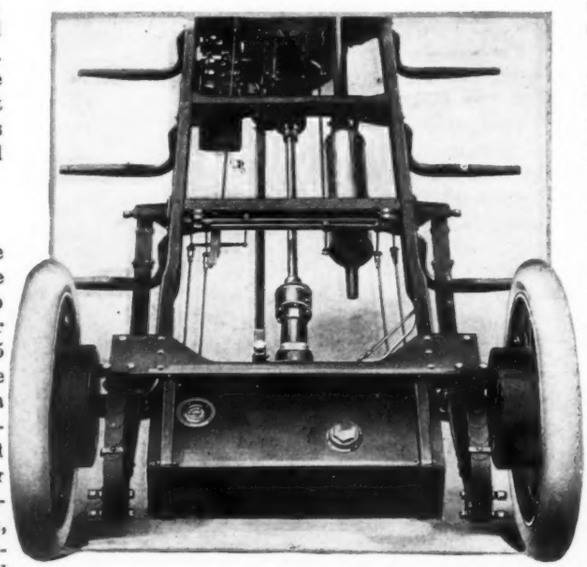
The Chandler is a light weight six, tipping the scales at 2,885 pounds fully equipped, and as such meets the growing demand among American buyers for a vehicle which will have a low fuel consumption, which will be easy on tires and which has unlimited flexibility. True, the Chandler is not the only light six in this field, but it is in the front rank. It reflects the policy of a number of well known automobile business men.

10 Per Cent. More Power

In adding 10 per cent. to the power output of the motor, the Chandler engineers have done so without increasing bore or stroke, which remain 3 3-8 by 5 inches, respectively. With these dimensions, the S. A. E. formula accords the engine 27.3 horsepower, but the maker rates it at 35, which is nominal. The motor is built by the Chandler company. In general construction, the power plant remains unchanged, but lighter pistons and a lighter flywheel have been incorporated. The cylinders are of the L-head type and cast in blocks of three. The use of lighter reciprocating parts is a growing tendency, and aids in the securing of better balance and increased speed, both of which factors are conducive to higher power.

The pistons on the new model are fitted with two piston rings each instead of three as formerly. This is a tendency in some of the best designs, and serves to reduce friction to the minimum and at the same time does not allow gas leakage past the pistons if the design is right.

Another change in connection with the engine is the adoption of a Rayfield carbureter. This Rayfield is specially designed for Chandler, and has only two adjustments.



Plan view of the 1915 six-cylinder Chandler chassis from the rear showing the new pressed steel torque arm replacing the torsion rod. Note pressure feed fuel tank in rear

The crankshaft is carried on three main bearings which are of large size and made of white bronze. Their dimensions are: Front, 1 7-8 by 2 1-2 inches; Center, 1 7-8 by 3 inches; and Rear, 1 7-8 by 3 1-2 inches.

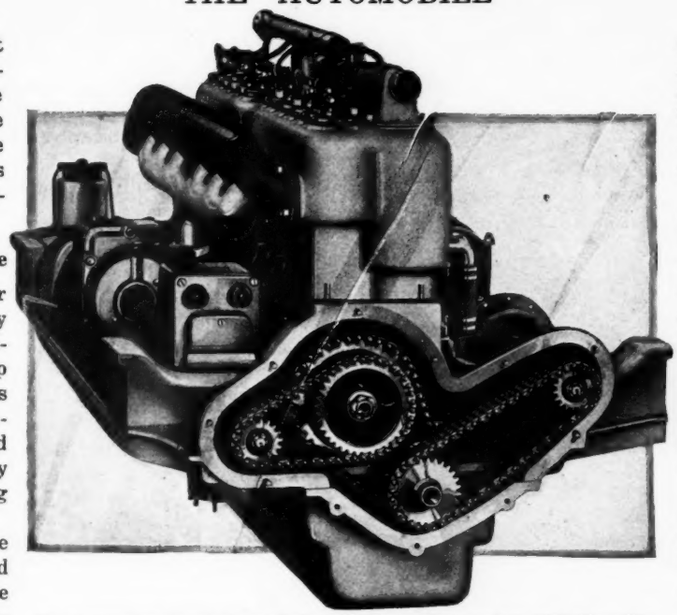
The Chandler company pays much attention to the careful balancing of this crankshaft. The crankpin bearings have the same diameter as the main bearings but are 2 inches long.

The camshaft, which is a drop forging with integral cams, is mounted on three bearings and driven from the front end. It operates the valves in the usual way through tappets. The valves have a 30-degree seat, which is flatter than ordinarily employed. Many makers prefer a 45 degree seat, but the Chandler engineers point out that the angle they em-

ploy cuts down the valve lift and the noise without increasing the gas speed. The lift is 9-32 inch. Valves are all interchangeable and are inclosed by cover plates readily removed for inspection or adjustment.

Silent Chain Camshaft Drive

A feature of the Chandler motor is the use of Coventry silent chain drive for camshaft, magneto and pump shaft, and generator. This drive is all completely inclosed at the front end, and its arrangement is clearly shown in the accompanying illustration.



Three-quarter front view of six-cylinder motor used in 1915 Chandler with timing gear case open, showing Coventry silent-chain drive

The oiling system of the Chandler motor is a combined force feed and splash type within a constant level maintained under each connecting-rod. A stream of oil is forced by the oil pump to each of the three main bearings, and another lead takes a supply to the chains at the front. All exterior oil piping has been eliminated, and the pump is located in the oil base. An accessible filling tube for putting oil in the reservoir is placed on the left side back of the magneto.

Bosch Ignition System

The ignition system makes use of a Bosch high-tension magneto in connection with Bosch plugs. The magneto is placed on the left side and back of the water pump. Its bracket is integral with the upper half of the crankcase.

The cooling is improved in that the piping has been changed and the system arranged to give better water circulation. The pump is a centrifugal type, and the radiator a Mayo honeycomb construction.

The electrical system is brought up to the minute. There are separate units for generating the current and for starting. These are of Westinghouse make, and the system used is of the single wire form. Both electric motor and generator are mounted on the right side of the engine, the generator being forward and designed to run at crankshaft speed, which tends to lessen noise and increase the life of the chain driving it.

The starting motor drives through the flywheel and is geared 15 to 1, turning the crankshaft at from 90 to 110 revolutions a minute.

In the headlights there are two sets of bulbs, one set of small size for city driving and the large bulbs for country work. The storage battery is hung alongside the gearbox on the left side and inside the frame rail.

Housed with the flywheel and in unit with the engine is the multiple-disk clutch, which has alternate disks of steel and Raybestos. The clutch mechanism has been improved throughout by the addition of a ball thrust bearing which serves to take the throw-out strain, and reduces friction. The clutch runs in oil.

The gearset, which is also in the motor unit, has three forward speeds and reverse. The gears are nickel steel and the shafts are mounted on F. & S. annular ball bearings. Gearshift and brake levers are mounted directly on the gearcase, thus giving center control.

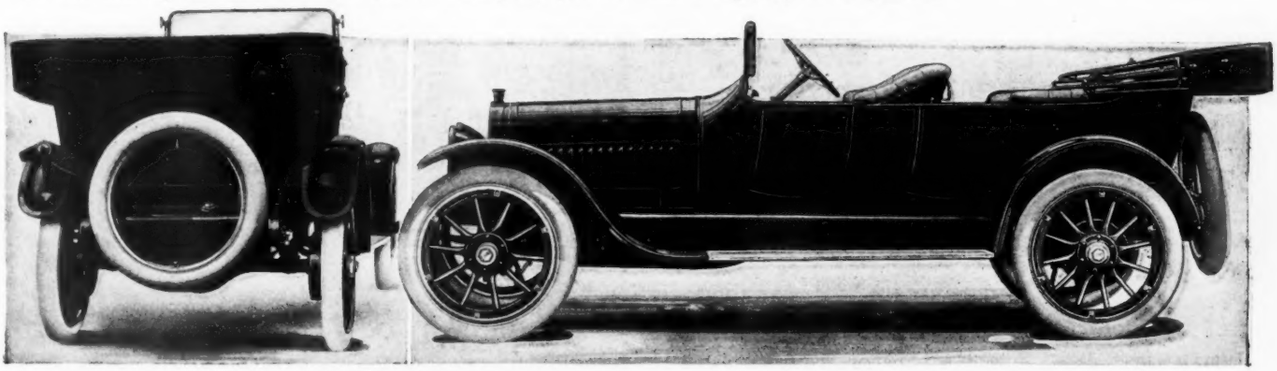
The power goes back to the rear through the medium of an open drive shaft fitted with a universal joint at either end. These are double Hartford universals. A pressed steel torque arm paralleling the driveshaft from the center cross-member back to the axle housing has been adopted. It has a ball and socket buffer construction at the front end, and is hinged at the rear in the usual manner. This type of torque arm replaces the heavier rod construction heretofore used.

The rear axle is a floating type which uses F. & S. annular ball bearings in wheels, shafts and differential. The usual means of reaching the differential unit is employed, whereby a cover plate when taken off exposes the mechanism, which may be removed as a whole without disturbing the rest of the axle after the shafts have been pulled out of engagement. The brakes are of the double internal expanding type, the shoes being faced with a heat-resisting friction material. The drums are 14 inches in diameter.

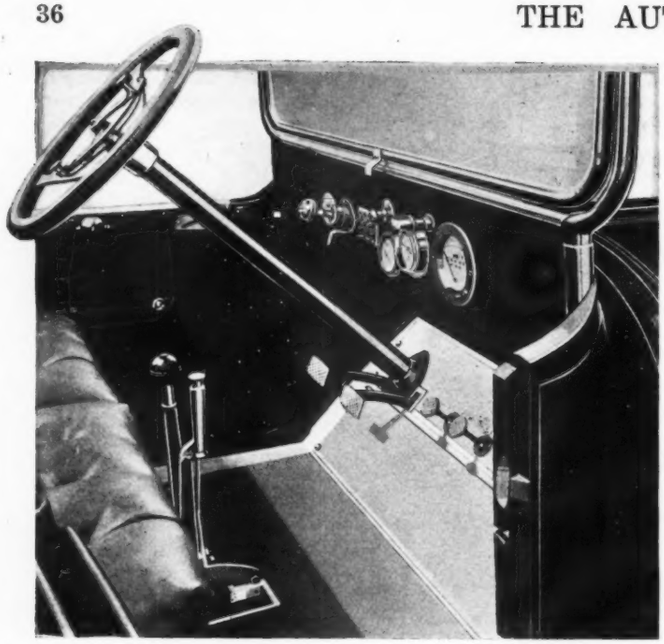
Rear springs, which are mounted outside the frame rails are three-quarter elliptic and mounted over the axle tubes. These, as well as the front half-elliptics, are 2 inches in diameter, and, due to their length, give easy riding.

Pressure Fuel Feed

The gasoline tank is also mounted at the rear and below the chassis level, feed to the carbureter being by pressure from a metal plunger pump on one valve lifter. The tank has a capacity of 20 gallons.



Left—rear view of 1915 six-cylinder Chandler, showing mounting of spare tire on new design tire carrier and also domed fenders. Right—left side of 1915 Chandler six, showing streamline body with clean running board and neatly suspended tire at rear



Control features of 1915 Chandler, showing left drive and center control as well as the arrangement of instruments on the cowl dash

The wheels are of the wood artillery type and carry 34 by 4-inch tires all around. The standard equipment calls for Firestone straight side or clincher, demountable and detachable rims.

The body, which is of streamline design, has undergone little alteration. Clean running boards are obtained through the mounting of the storage battery within the frame and the placing of the spare tire at the rear on brackets which are of a special form designed by the Chandler engineers. The width of the fenders has been increased somewhat, however, and they are of domed form, which is a touch to be appreciated by the fastidious owner.

Equipment Is Complete

The body arrangement is up to the minute. A very neat and symmetrical arrangement of the instruments on the cowl board serves to set off the front compartment, while the rain-vision, ventilating windshield adds its finishing touch. The cushions are 10 and 12 inches, and the seats, front and rear, have high backs which are a feature for comfort. The rear seat is 47 inches in width.

The equipment is complete in every respect. Among the items may be mentioned an electric motor horn, Jones speedometer, New Haven 8-day clock and Jiffy curtains.

The wheelbase is 120 inches and the road clearance 10 1-2 inches.

Beside the standard Chandler roadsters and touring cars, coupé, sedan and limousine models are also furnished or order.

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$9,000,000 for Ohio Roads in 1914

COLUMBUS, O., June 26—Fifteen million dollars will be spent for good roads in Ohio this year, according to the estimate of State Highway Commissioner James R. Marker. Of this sum, $9,000,000 will be spent on contracts under the supervision of the state highway department. The remaining $6,000,000 will be spent directly by counties and townships.

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A Motor Show at Indiana State Fair

INDIANAPOLIS, IND., June 27—A motor show will be held at the Indiana State Fair, just north of the city, by the Indianapolis Automobile Trade Association. The fair will be held 1 week beginning September 7, and usually attracts thousands of visitors from all parts of the state.

It has not been customary for motor car and allied concerns to exhibit extensively at the fair on account of lack of space. This will be solved by using the immense tent in which the association held a show downtown in the spring of 1912. The tent will be reserved exclusively for exhibits of members of the association.

George O. Wildhack was elected a director in the association. He will fill the unexpired term of R. P. Henderson, who recently became identified with the Regal Motor Car Company, at Detroit, Mich.

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Fifth Avenue Buses Carry 1,500,000 in May

NEW YORK CITY, June 26—During May more people used the motor buses on Fifth avenue and Riverside Drive than ever before. The Fifth Avenue Coach Co. hauled nearly 1,500,000 passengers during that month, which is considerably in excess of any previous month in the company's history. The big day of the month was May 3, when 61,400 passengers were carried. This, however, is not the company's record day, as on April 19, nearly 64,000 people were carried, that day being Sunday.

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N. Y. Has 27,791 More Cars Than in 1912

NEW YORK CITY, June 26—"Another striking commentary upon the growth of automobilism in New York State," said Mitchell May, secretary of state, "is shown by the registration figures during the last 4 months, when more cars were licensed than for the entire year last past, or 27,791 more than the total number in 1912, when 107,262 were registered.

"At the end of May, 1913, 107,299 machines had been registered, while this year at the same date the number has increased 24 per cent., the total being 135,053. As might be expected, about one-half of these cars, or 62,134, are to be found in the New York district. The number of commercial vehicles in use is already far beyond the total for the whole of last year."

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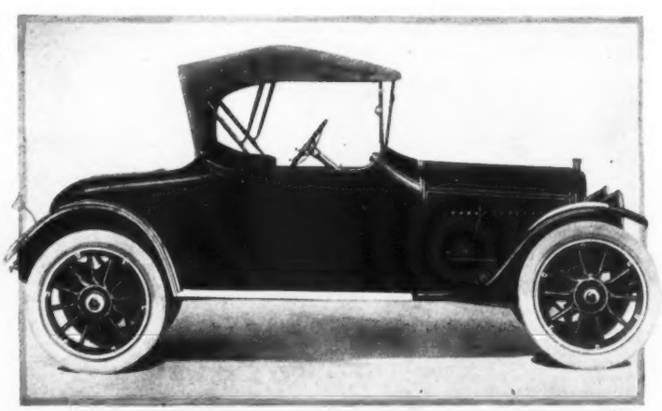
Willard Battery Branches for Europe

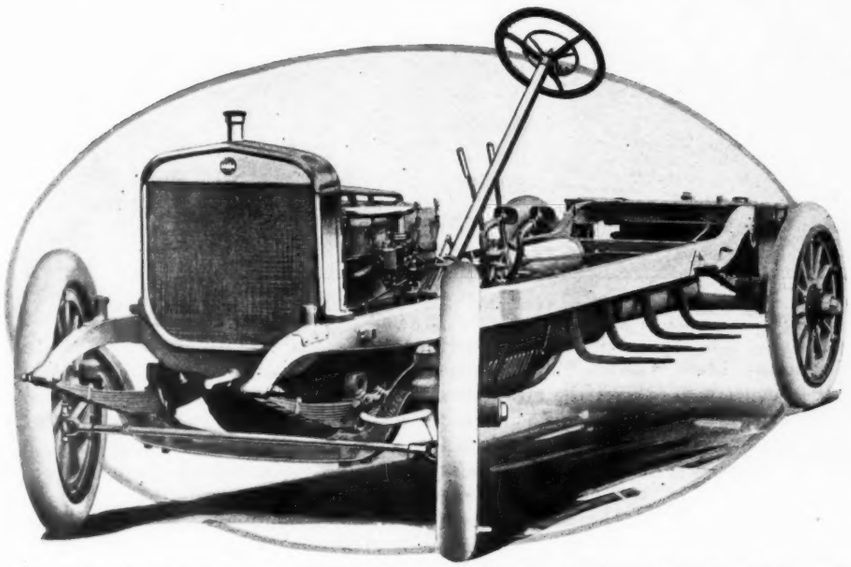
CLEVELAND, O., June 26—R. C. Norberg, assistant general manager of the Willard Storage Battery Co., Cleveland, O., sailed for Europe early this month to arrange for installation of a branch of the Willard company and establish service stations in the larger European cities. The company's foreign business has increased very rapidly during the past 2 years and during his stay, Mr. Norberg will visit several existing connections, manufacturers and dealers who are handling or using the company's batteries.



Right side of 1915 Chandler roadster, showing streamline design and ample space provided in rear deck

Winton Minimizes Vibration

All Moving Parts Balanced —New Streamline Body Design—Electric Starting Optional — More Resilient Springs



Three-quarter front view of 1915 six-cylinder Winton, showing enlarged radiator and more resilient and improved spring construction

THE details of the 1915 Winton six, known as model 21, have been made public and indicate that, while the car has undergone very little change mechanically, improved appearance has been obtained by complete re-designing of the body. Besides this, electric starting has been made optional with the purchaser, the Winton air system of turning the crankshaft, which method was used exclusively heretofore, being fitted instead, as desired.

The body retains its streamline effect, while a new beauty has been given it by the raised panel which outlines the upper edge of the body all around. The cowl has been sloped so as to meet the hood, and thus body and bonnet are blended into a smooth-line unit. Greater roominess in the front seat is obtained by this new body design.

Radiator Enlarged to Harmonize

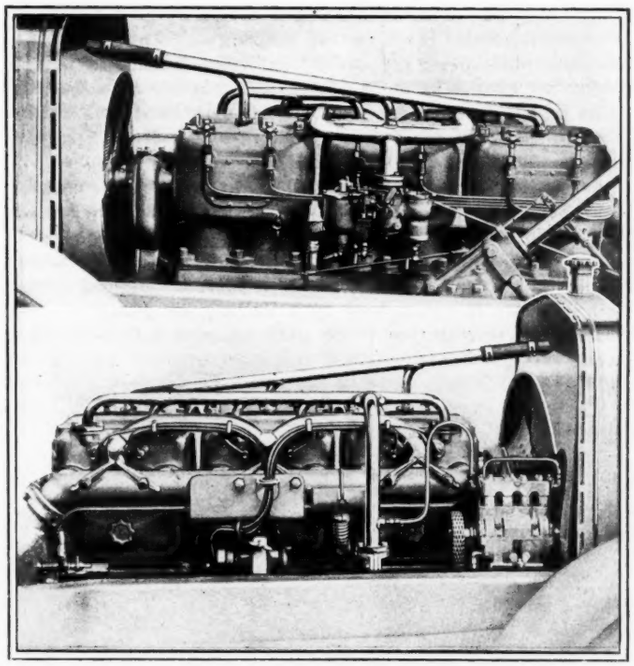
The radiator has been made 2 inches higher and 2 1-8 inches wider, which, of course, means a larger bonnet. This is in good proportion to the body size and gives a pleasing appearance to the whole.

There has been no appreciable change in the engine and its allied units. It has a horsepower of 48.6 according to the S. A. E. formula. The cylinders, which are 4 1-2 by 5 1-2 inches, are cast in pairs with the valves all on the right. The same intake manifold construction is employed, whereby the carbureter is placed on the left side and the two-branch manifold running from it passes over the tops of the cylinders to the valve side where these branches in turn run into a horizontal pipe with an opening into each cylinder block. One change in equipment is the adoption of a Rayfield carbureter.

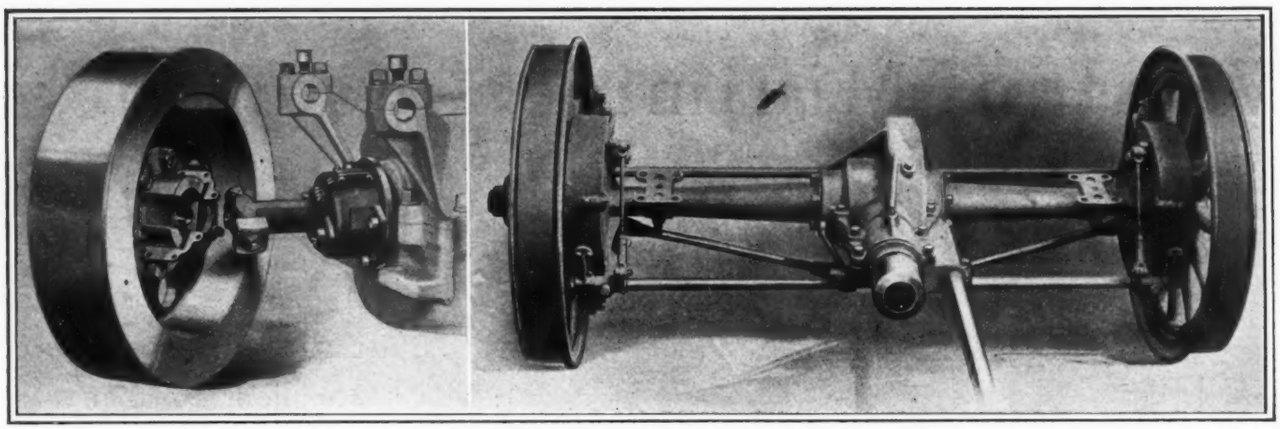
The Winton still uses the vertically split aluminum crankcase which divides into right and left halves to provide for the ready removal of the crankshaft or other working parts. The main crankshaft bearings are in the right half, allowing the other side to be taken off without disturbing them. In the left half there are three 5 by 8-inch hand holes which allow complete inspection.

The moving parts are all of careful design and balanced so as to reduce vibration to the minimum. The pistons, rings, connecting-rods, and wristpins of any one set are all of the same weight to give this balance; the crankshaft, which is carried on four Parsons white brass bearings, is made of nickel steel; the camshaft and cams are a one-piece forging, the profile of the cams being such as to give a flow of gas proportionate to piston speed. This shaft is removable through the front of the case without any of the rest of the valve mechanism. The valves themselves are 2 inches in diameter and interchangeable. The timing gears at the front are of drop forged steel, spirally cut as a noise-reducing medium and accurately finished.

The Winton system of lubrication is still unchanged. Circulation of the oil is by two pumps, operated by an eccentric on the rear end of the crankshaft. One pump takes oil from the reservoir and delivers it through tubes to the crankshaft main bearings and the timing gears from which points it runs into the crankcase. The other pump draws oil through strainers from the crankcase and returns it to the tank, where it is again strained before use. The oil tank is at the



Upper—Intake side of 1915 Winton motor, showing mounting of new Rayfield carbureter and shield for gear-driven fan. Lower—Exhaust side of Winton motor showing mounting of magneto and hot-air connection for carbureter



Left—Universal joint between flywheel and gearbox on 1915 Winton which permits of easy demounting. Right—Rear axle of 1915 Winton, showing strong construction and large brake drums

right of the engine. The cylinders, cams and camshaft bearings get their lubrication by the splash of the connecting-rods, while grooves in the pistons distribute it around the surfaces. To prevent a smoky exhaust due to excessive oil, the flow of the lubricant is regulated by a by-pass in proportion to the motor speed.

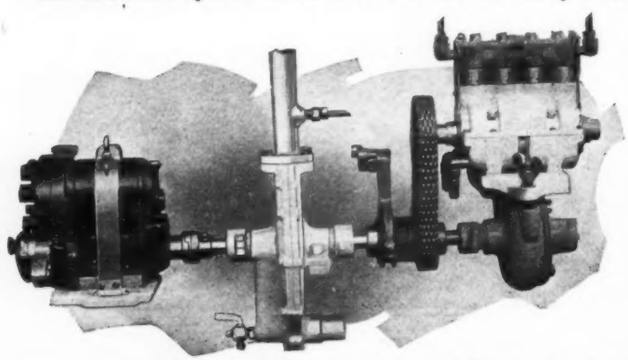
Shield Now Surrounds Fan

The ignition is by either a Mea or a Bosch dual magneto with a storage battery to supply auxiliary starting current. The plugs are still placed horizontally in the cylinders over the intake valves so that they are swept by the fresh incoming mixture. The plugs are 7-8 inch standard. The magneto is placed on the right side of the engine at about mid-distance back, and strapped down on an integral crankcase bracket. It is driven off the end of the shaft which takes care of the centrifugal water pump drive and the silent chain drive to the air pump. This driving assembly is shown in one of the illustrations.

Due to the increased size of the radiator, even greater cooling surface is presented by it, the increase over last season's being about 14 per cent. The fan is driven by gearing which is inclosed at the front end of the engine. This drive has an adjustable spring-tension clutch which is said to secure proper air suction without possibility of accident to the fan or its adjacent parts. The fan is now surrounded by a shield which directs the air to the cylinders and acts as a safety feature. This shield was not used last season.

As already mentioned, the well-known Winton air cranking system may be had, or the engine will be equipped with an electric cranking apparatus. In the air system, there is a pipe connection to each cylinder head, and the pressure from a tank is sent to the cylinders to force the pistons down. This pressure is maintained by a Kellogg air pump.

The electrical system to be used has not definitely been decided upon, several makes being tested out at this time. With the air system a Gray & Davis generator is used for furnishing current for lights. A Willard storage battery is also employed. It is probable that the same make of generator as the motor used for cranking will be installed when this part of the apparatus is decided upon.



Arrangement of magneto pump and tire pump shaft on 1915 Winton. Note the silent chain drive for tire pump

The Winton model 21 uses the same type of multiple disk clutch as its predecessor. There are sixty-three high carbon steel disks, thirty-one of which are attached to the transmission shaft and thirty-two to spiders driven from the flywheel. The unit runs on F. & S. annular ball bearings, while four springs held in pockets and spaced equidistantly around the clutch distribute the disk tension equally. Because the disks operate in oil, there is no jerky action, the oil films having a cushioning effect. The clutch unit is housed in the forward end of the gearcase and is readily accessible through a hand hole.

Four Speeds—Direct on Third

The gearset which is not in unit with the engine affords four forward speeds and reverse, with direct on third. The shifting is selective, the gears sliding. Interlocking arrangements make it possible to enter neutral when the clutch is engaged, but impossible to get any other gear combinations. The gears have wide faces, and are constructed of a special alloy steel.

There is no change in either the driveshaft back of the gearbox or in the rear axle. The shaft is fitted with a cross-type universal at the forward end and has a roller type universal at the rear. The axle is floating and made with a large factor of safety. The differential unit is readily removable, as are the shafts and bearings. Gears are of nickel steel, and Timken bearings are used throughout the rear member. Conventional internal and external brakes operating on the usual form of drums are employed. A torsion rod parallels the driveshaft to take the drive, etc.

Universal Between Clutch and Gearbox

In the transmission of the power back from the engine, there is interposed between the motor and clutch a universal joint similar to that at the rear end of the driveshaft. This is inclosed in a grease-tight metal case, removal of half of which allows the dismounting of the gearbox so far as the front end is concerned. At the same time, it takes care of any possible misalignment between gearset and crankshaft.

Dann Oil Cushion Spring Inserts

The springs are three-quarter elliptic in the rear, and made long so as to give low suspension. More leaves have been added this year, the leaves being thinner. This makes for greater resiliency. The rear springs take the place of

radius rods, having no front end shackles, and being suspended outside the frame. The diameter of the shackle bolts has been increased and a new form of rebound straps supplied. A new feature of the Winton spring construction is the incorporation of the Dann lubrication cushion inserts between the leaves. These inserts have pockets of congealed lubricant and keep the springs in good shape at all times. They are standard equipment. The spring sizes are: Rear, 46 1-2 by 2 inches; Front, 52 by 2 1-4 inches.

Tires all around are 37 by 5 inches which is an increase over last season, in that 36 by 4 1-2 inch tires were then used. The wheels are of 12-spoke artillery wood type.

Left Steer and Center Control

Steering is on the left and control in the center, which is well-nigh standard in America now. Spark and throttle levers are on the wheel, which is 18 inches in diameter. A new form of spark and throttle ball joints is now used on the control rods in that they have springs to take up backlash.

The wheelbase is 130 inches on the runabout and four-passenger cars, while the larger types have this dimension increased by 6 inches. Some body dimensions of the five passenger car are: extreme width, 70 inches; distance from dash to seat, 26 inches; height of driver's seat from floor, 16 inches; width of front doors, 22 inches; width rear doors, 24 inches; distance front to rear seat, 33 inches.

The doors have all been widened and are carried on concealed hinges. Handles do not extend through them. Cars having auxiliary seats are provided with inclosed compartments where the seats may be stored when not required. The cowl board fixtures have been re-arranged to give a symmetrical appearance and ultra convenience to the driver, while a tonneau light is also a new kink that will be appreciated.

Prices Are Unchanged

Equipment is complete and includes one-man top, a new design of rain vision glass front, Waltham 8-day clock, tire carriers of a new type at the rear, tire pump, Klaxon horn under the bonnet. Prices are unchanged. The roadster and four-passenger are $3,250; the six- and seven-passenger, $3,500.

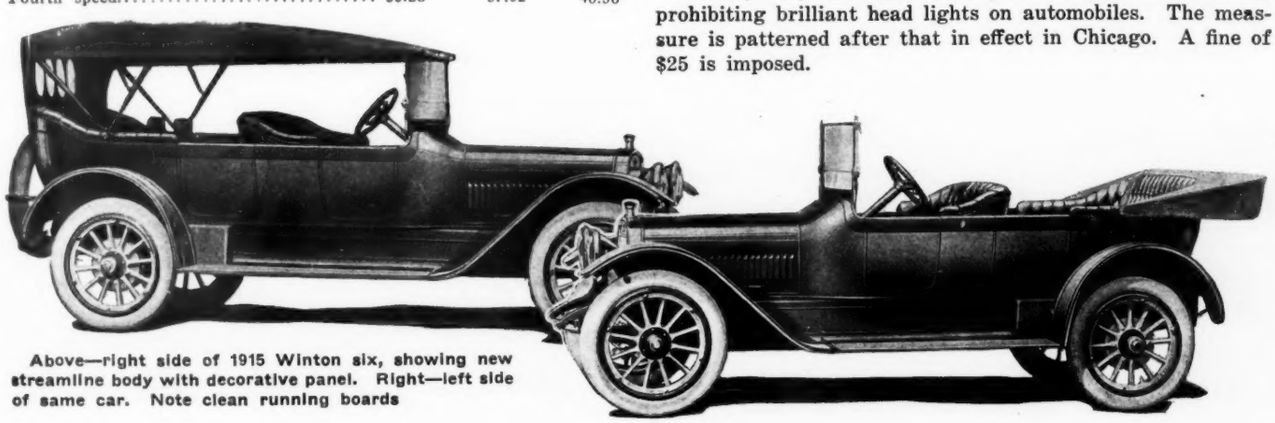
Some of the dimensions of the new Winton model 21 follow:

Length of frame rails, roadster and four-passenger cars—179¼ inches.
Length of frame rails, all other models—185¼ inches.
Width of frame front—28 inches.
Width of frame rear—31 inches.
Clearance—9¾ inches.
Optional gear ratios—3.928 to 1; 3.69 to 1; and 3.428 to 1.

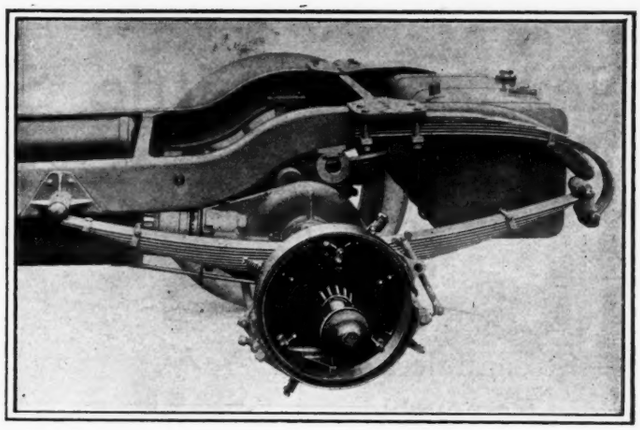
The following shows the speed of the car in miles per hour at 1,000 revolutions per minute of the engine:

BEVEL GEAR ON DRIVESHAFT AND REAR AXLE

Transmission	3.928	3.69	3.428
First speed	9.00	9.59	10.32
Second speed	19.42	20.67	22.23
Third speed	28.02	29.82	32.09
Fourth speed	35.28	37.52	40.36



Above—right side of 1915 Winton six, showing new streamline body with decorative panel. Right—left side of same car. Note clean running boards



Rear construction 1915 Winton, showing three-quarter elliptic springs, mounting of pressure feed fuel tank and interior arrangement of brake drum

Pa. Creamery Haulage Line Must Pay Delaware License?

WILMINGTON, DEL., June 26—A test of one phase of the Delaware motor-vehicle law is being made through a case brought against two chauffeurs employed by the P. E. Sharpless Co., which has three dairy products factories in Pennsylvania and brings practically all of its products to Wilmington in motor trucks (four tons each) for shipment to Philadelphia by boat. It has no Delaware trade and claims that it is exempt for that reason from Delaware license, through the reciprocal clause in the state law. It operates its trucks on Pennsylvania licenses.

Delaware authorities evidently believe that the company should pay a Delaware license, for the operators of the cars are under prosecution in the present case, charged with operating cars in Delaware without a license, on the ground that the company is making a regular business of bringing its products here.

Philip L. Garrett, counsel for the defendants, claims that his clients are not doing business in Delaware, but are merely engaged in interstate commerce when their trucks come into the city. The court therefore has two points to decide: the extent of the reciprocal clause in the state law and whether the company is doing business here or merely engaged in interstate commerce. Mr. Garrett bases the latter contention on the fact that as Delaware reciprocates all privileges accorded by Pennsylvania it must also include the phase of the Pennsylvania law which exempts all foreign corporations except those doing business in the state.

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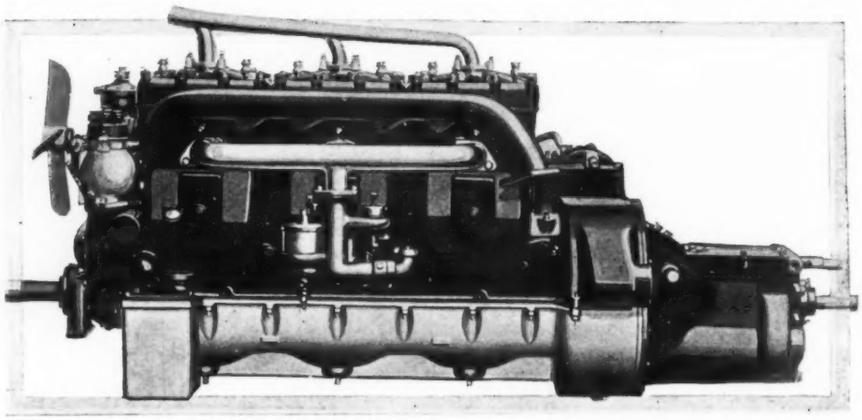
PEORIA, ILL., June 25—The city has adopted an ordinance prohibiting brilliant head lights on automobiles. The measure is patterned after that in effect in Chicago. A fine of $25 is imposed.

New Cole Little Six Has High-Speed Block Motor

Is Capable of 24 R.P.M. —Streamline Body— Removable Cylinder Heads in Pairs—Few Changes in Big Six Except $135 Price Reduction



Intake side of new Cole little six motor, showing mounting of carbureter on block casting

A NEW model has been added to the Series 10 Cole cars. The newcomer is a little six of practically the same horsepower and almost the same size throughout as the new four announced in April, and described in THE AUTOMOBILE for April 23. The appearance of the little six gives the Cole three chassis models, the Series 10 big six selling at $2,465, a reduction of $135, which is quite similar to the 1914 six-cylinder car, the Series 10 little six at $1,865, and the Series 10 four, at $1,665.

Removable Cylinder Heads in Pairs

The feature of the series is the little six, which has a 3½ by 5-inch I-head motor. The cylinders and the upper half of the crankcase are cast in block, although the removable cylinder heads are in pairs, so that there are three separate cylinder heads, the removal of any of which exposes two cylinders. The clutch and gearset are in unit with the engine, making a unit power plant. The crankshaft is carried on four bearings and a constant level splash-pressure system takes care of the lubrication.

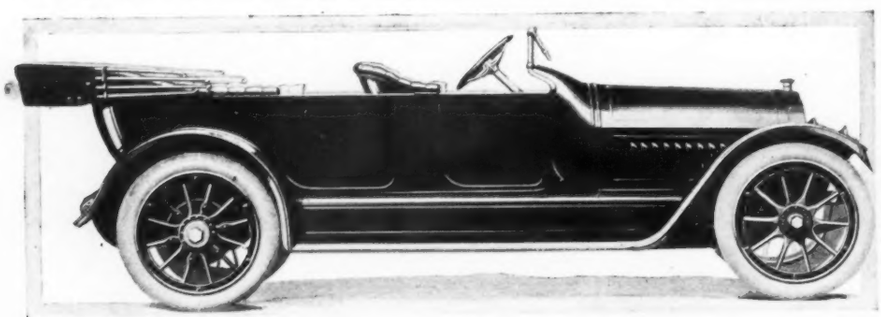
A new feature of the engine is the arrangement of the breathers. Instead of the usual type of breather pipes, an opening is provided through the cover of the valve stems and push rod housing, so that a separate breather is provided for each of the three pairs of cylinders. Carburetion is provided by the new G-2 Stromberg carbureter which feeds through a short-branched intake header. Cooling is taken care of by a centrifugal pump on the right side of the engine, a Mayo cellular type radiator, and a three-bladed aviation propeller type of fan. Ignition is by the Delco electric system with automatic spark advance. The same system supplies the lighting and starting functions.

Long-Stroke, High-Speed Motor

Along with its comparatively long stroke, the engine is of the modern, high-speed type, and is capable of running up to 2,400 revolutions per minute. Block casting of the six-cylinder engine is a departure from former Cole practice, and the little six engine differs in this respect from the big six, whose cylinders are cast in pairs. The reason for this seeming change of heart among the Cole engineers is due to the difference in the size of the engine. With the cylinders 3 1-2 inches bore, it was found that the block casting was not too bulky and heavy to be handled by the average garage, and that consequently the greater rigidity, better alignment, and freedom from vibration of the block casting could be obtained without sacrificing too much through the weight of the casting. In the big six, however, as in the four, 4 1-4 by 5 1-4 cylinders would make too unwieldy a casting, if all cylinders were a unit.

One of the features of the little six engine is the use of large diameter, flexible tubing for the exhaust pipe. This permits long, easy sweeps of the exhaust line and prevents back pressure. The timing gears on the little six engine have spiral teeth.

Aside from the engine, the little six is the same as the four, which has been described previously. The wheelbase is 120 inches instead of 118 inches, the added 2 inches being under the hood, on account of the extra length of the six engine. Briefly, the chassis comprises an improved cone type clutch and a three-speed gearset in unit with the engine, Timken axles and bearings, the rear being floating, service and emergency brakes, contracting and expanding on 15 1-2 by 2 1-2-inch wheel drums, left hand drive, center control, irreversible Gemmer steering gear with an 18-inch wheel, and a carbureter air control located on the steering wheel column.



Side view of new Cole little six, showing harmonious streamline design

The frame is a channel section, double drop, pressed steel, extended in the rear to carry the gasoline tank and the tire irons. The fuel tank is a Janney-Steinmetz pressed-steel seamless tank with a circular section. The fuel is fed to the carbureter by the Stewart-Warner vacuum system. The tires are 34 by 4½ inches, mounted on Firestone demountable rims with Firestone tires as regular equipment. The springs are three-quarter elliptic in the rear and are of oil tempered steel. They are the Detroit self-lubricating springs.

Bodies include a two-passenger roadster, four and five-passenger touring and a coupé. The design is streamline with a cowl extended several inches back, 24-inch doors with concealed hinges and locks, straightline splashers and fenders, and long clear running boards. The equipment includes quick-acting curtains, Stewart-Warner speedometer, oil sight feed, all the instruments being set flush in the cowl. The windshield is of the automatic ventilating, rain-vision type. The Delco electric unit cranking, lighting and ignition system is so arranged that the generator cuts in at 300 revolutions per minute, or, at a car speed of under 10 miles per hour. Above that speed it supplies a constant voltage to the Exide battery. The headlights are of the double bulb type, providing a powerful lamp in focus for country driving and a 4-candlepower bulb, out of focus, for city driving. A slight change has been incorporated in the Delco starting system, in that the starting pedal is now separate from the clutch. One of the features which will be appreciated is the adjustable pedal for clutch and brake. These can be adjusted to any length for greatest comfort of the driver.

There has been very little change in the Cole big six, as compared with the construction of the earlier series. The price has been reduced $135, so that it is now $2,465. The chief alteration is in the adoption of the vacuum feed fuel system and the consequent cleaning up of the dash. This eliminates two leads from the carbureter to the reservoir, and does away with the pressure gauge and hand pressure pump on the dash. The motor is an L-head six-cylinder type, 4 1-4 by 5 1-4 with cone clutch and three speed gearset as a unit, the power plant being suspended at three points. The wheelbase is 136 inches and tires are 36 by 4 1-2 inches.

The Cole big six, which is practically unchanged from last year, making a difficult turn

Aside from the equipment as mentioned on the little six, there is added to the big six a Taylor Noil motor driven tire pump. An oil sight feed set flush in the cowl board and the outfit of tools is carried in a drawer under the front seat. The rear doors in this car are 26 inches wide. The bodies include a two-passenger roadster, six and seven passenger touring, a coupé, and a seven-passenger limousine.

New Kissel Kar Six Has Two-Door Touring Bodies

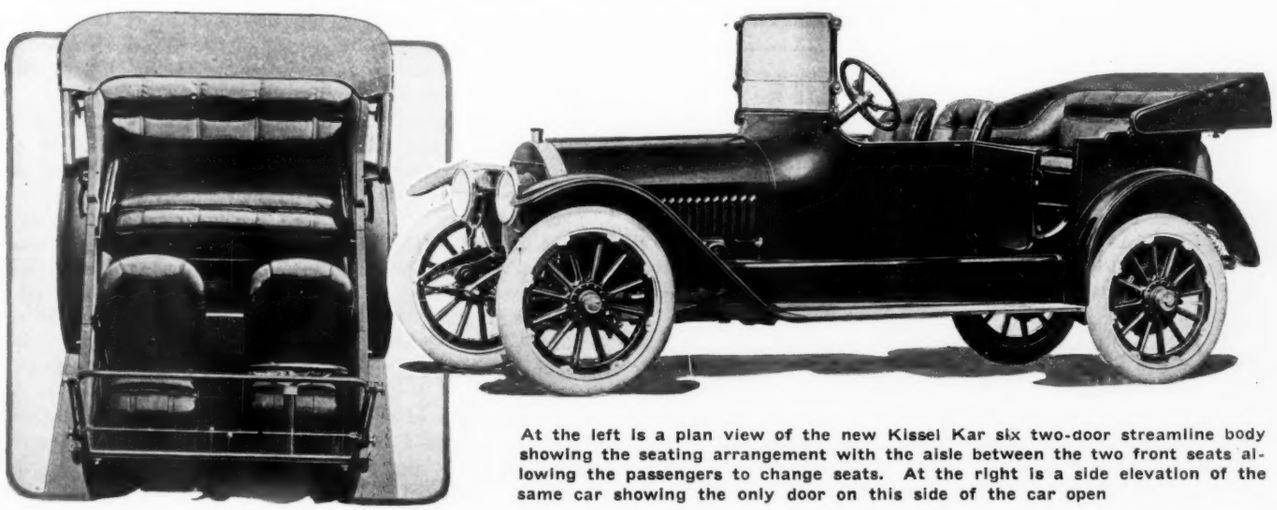
UNUSUAL body design and greater accessibility are the features of the new six-cylinder model recently announced by the Kissel Motor Car Co., Hartford, Wis. This new car will be a part of the 1915 production.

Adoption of a two-door, single-compartment body design is the unique feature of the six. Both four- and five-passenger bodies will be fitted to this new chassis, the four-passenger car differing from the five in that a dividing arm is used between the rear seats.

The two-door body is made possible by the use of individual seats for the driver and his side-passenger, thus making an aisle between. This single-compartment feature allows passengers to exchange seats without leaving the car.

To those preferring a four-door body, two models are offered, one for five and another for seven passengers.

The power plant of the new six consists of a 4 by 5.5-inch motor equipped with a leather-faced cone clutch and a four-speed gearset with direct on third. A noteworthy feature is the position of the push rod which is clamped inside of the valve inclosure. Instead of being pressed into the cylinder the guide, as well as the rod, is accessible for removal without lifting the cylinder from the crankcase.



At the left is a plan view of the new Kissel Kar six two-door streamline body showing the seating arrangement with the aisle between the two front seats allowing the passengers to change seats. At the right is a side elevation of the same car showing the only door on this side of the car open

The Engineering Digest

Minor Innovations in European Cars, Accessories and Parts

ACCESSIBILITY, NEW TOOL, PUMP, LAMPS, MOLDINGS

DISMOUNTING the pistons and adjusting the connecting rod bearings without taking the motor apart otherwise is a mechanical feat which can be accomplished in the case of the British Maudsley motor by virtue of the large gates in the sides of the upper half of the crankcasing and by the method indicated in Fig. 1. By turning the crankshaft to a suitable position, the nuts can first be removed from the connecting-rod knuckle, and by turning the crankpin to the position shown the piston can thereafter be pulled down and out through the gate. The cylinder is chamfered at the bottom to make it easier to get the piston back again.

Pincers have been devised the jaws of which are turned outward and are adapted for holding the free ends of a piston ring a certain distance apart. An adjustment screw serves to fix this distance at just the point at which the ring can be slipped over the piston. By this means all accidental and unnecessary violence to the frail ring is avoided.

According to a 1913 design by Bugatti the water pump is mounted in tandem with the magneto on a prolongation of the crankshaft and draws water directly from the lower

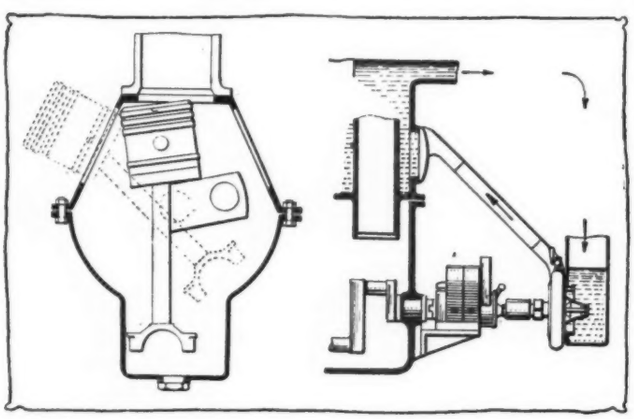


Fig. 1—Mandsley motor

Fig. 2—Pump arrangement

reservoir of the radiator in the manner shown in Fig. 2. The arrangement presupposes special design features for the magneto and other means than the ordinary crank for starting the motor.

In a 12-horsepower Darracq the headlights are carried each in a fold of the sheet metal curtain of the fender, as indicated in Fig. 3, and the street lamps in the forward dip of the fender. Both headlights and lamps are of course electric.—From *La Vie Automobile*, June 6 and 13.

A French firm has conceived and executed the idea of turning out moldings for automobile bodies in ebonite, and Fig. 4 shows a variety of the shapes so far placed in the market. While ebonite is more expensive than wood as a material and its natural black lustre is suited mainly for carriages finished in black, it can easily be bent to almost any desired curvature when softened in warm water and will hold the shape given it; it requires no varnish and holds its finish without much caretaking.—From *Omnia*, May 16.

SAVING HIGH-SPEED STEEL—The Rosner method, developed in this country, for making high-speed tools by welding a tip of the expensive high-speed steel to a shank of ordinary mild steel, while accomplishing the hardening of the tip by the same operation as the welding, is favorably commented upon in *Werkstattstechnik* of June 1 and is credited with a saving of about 40 per cent over full-length tools of the costlier material. The advantage over short tools used with toolholders lies in a better radiation of heat through the shank and the better preservation of the cutting-edge which is the result. The high-speed tip, if long enough from the beginning, can be reforged and rehardened as if there were no weld.

Carbureter Throttled by Varying Area of the Venturi Port

IN most carbureters the narrowest place of the Venturi tube remains in the same place and is supposed to regulate the siphon action upon the gasoline in the jet. But when the throttle is closed so much that the sectional area which it leaves for the passage of the gas mixture is smaller than the sectional area of the Venturi channel around the jet, the location of the greatest suction is changed to the smaller area, and this, according to the idea of the designer of the Jann carbureter, causes disturbances in the continuity of the gas flow, which result in irregular and jerky accelerations.

The principle of the Jann carbureter, Fig. 5, is therefore that of throttling always at the same level around the jet, and this is done by substituting for the ordinary butterfly throttle a piston-like body with a succession of conical rings D which can be moved up and down concentrically with the jet. As the intervals between these cones and the central openings in them are graduated progressively, there corresponds to each position of the throttle: (1) a certain air section around the jet, determined by the size of the opening in the nearest higher cone, (2) a certain section for the passage of the gas mixture, determined by the sum of the circumferential openings of all the cones above the level of the jet, and (3) a certain orifice of the jet, determined by a needle *a* which moves up and down with the throttle body and enters more or less deeply into the bore of the jet.

In the extreme low position of the throttle-body, the sleeve K, surrounding the jet enters the central opening of the smallest diffuser-cone, almost blocking the passage of air, and this is the position for still-running.

The butterfly valve A noticed at the top of the device is not, according to the description, in itself a control member, but, being spring-connected with the throttle-body whose down-movement causes it to turn against the spring-resistance, it exerts a steadying influence and reduces the suction acting against the throttle-body, especially when this suction is at its maximum, in the position for still-running.

Other features of the Jann carbureter are the relatively capacious chamber J in the jet, which serves as a reservoir for accelerations, the calibrated bore *j* by which the carbureter is regulated to different motor sizes and the hot-

air pipe H which can be removed if desired. [The description states that the sleeve K can be adjusted by means of a knurled nut, but the illustration does not show a construction rendering this feature possible.]—From *Omnia*, June 6.

Bonecourt Surface Combustion System with Liquid Fuel

WHILE the Bonecourt-Schnabel system for burning gas with a minimum of waste of the heat units contained in the fuel is of immediate interest mainly for economizing stationary steam engine practice and for use in mines and tunnels, where the very small amount of combustion gases from the flues and their coolness constitute features of great practical value, it continues to claim attention in wider circles on the strength of its scientific peculiarities which suggest that the principle may eventually be applied to small power plants for motor vehicles and in other now unforeseen directions. The combustion of gas, in the fire flues of a steam boiler on the Bonecourt system, was originally flameless and took place in the interior of a porous fireclay or chamot lining or filling of the tubes, but (as reported in THE AUTOMOBILE of May 21) practical difficulties led to modifications, after which the system can no longer be designated as strictly flameless, at least not so far as its development in Germany is concerned. *The Engineer* (London) now gives in its issues of May 15, 22 and 29 an account of the most recent experiments with the system in England, from which it appears that considerable headway has been made with the use of liquid and solid fuels, especially the former. The process employed is illustrated diagrammatically in Fig. 6 and consists in injecting the liquid fuel together with the amount of air required for its combustion into a chamber of small dimensions in which a partial gasification of the liquid takes place.

A fireclay sleeve in the front end of the boiler tube serves to conserve a certain amount of heat within the chamber thus formed. The chamber is closed at the same end by means of a fireclay plug, through an aperture in which the oil and air supplies are introduced. At its further end it is closed by a perforated septum, through which the gaseous products pass from the gasification chamber into the refractory packing in the boiler tube. Each boiler tube carries its own gasification chamber and porous refractory packing for the acceleration of the combustion. The dimensions marked on the diagram are those of a boiler erected at the London works of the Bonecourt company, and this boiler has been successfully fired for the past few months on the principle described, being in operation every day and supplying the works with power. The air required for the combustion is supplied by means of a fan developing a pressure of 35 inch water column, and the oil is fed to the tubes by gravity with a 12 foot head. Spraying of the oil in the gasification chamber is effected by the rapid flow of the air.

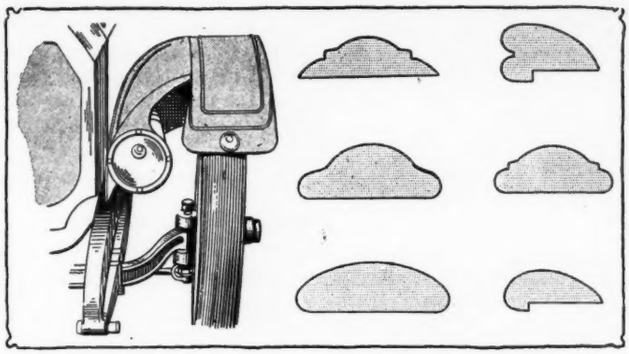


Fig. 3—Disposal of lamps

Fig. 4—Ebonite moldings

This boiler evaporates 25 pounds of water per square foot of heating surface per hour and, in doing so, utilizes 92.5 per cent. of the calorific value of the oil burned.

The nature of the refractory porous material naturally makes it difficult to apply the system, as it stands today, to boilers with fire tubes of the small dimensions which alone can be of interest from the automobile viewpoint; yet it is noticed that in another boiler which has been installed at the Bonecourt works the diameter of the tubes is reduced to 6 inches, and in the German experiments practically all the troubles arose from the presence of impurities, notably sulphur compounds in the gas used, which caused clogging of the porous material. As economy is at present the chief object in view in the development of the process, no data have as yet been offered based on the use of gasoline for fuel and small dimensions of the tubes and linings.

Rotary Pump and Hydraulic Transmission with Gear Wheels

THE working principle of a new rotary gear pump is indicated in Fig. 7. The mechanism consists of a rotatable elliptical spurwheel, an internally geared ring almost square in elevation and six circular spurgear pinions meshing between the ellipse and the square. As the ellipse is revolved, the space between any pair of the pinions increases from a minimum to a maximum and then decreases from the maximum to the minimum again. While each space is increasing it is in communication with a suction port, and while decreasing it communicates with a delivery port. The device is the invention of H. Dock of Westerly, Rhode Island, and can be used also as a hydraulic motor by letting the working fluid in at one set of ports and out at the other. A motor and pump combined have been constructed in the form of a hydraulic transmission with variable speed. For this

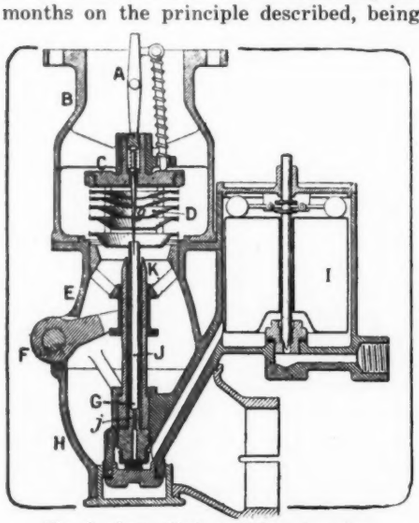


Fig. 5—Jann "Integrale" carbureter

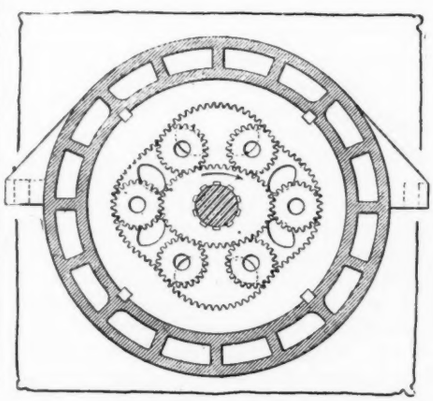


Fig. 7—Rotary pump and hydraulic gear

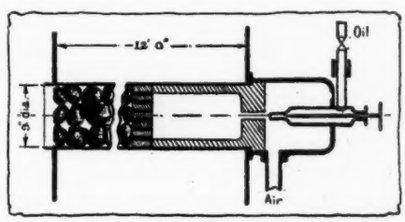


Fig. 6—Bonecourt system for liquid fuel

purpose the pump portion is in duplicate. The deliveries of the two pumps can be arranged to oppose each other or to assist each other to any desired extent up to the full maximum, by moving the relative positions of the internal and the elliptical gears of the two parts, and in this manner variations of the motor speed from zero to maximum is obtained in both directions.—From *The Engineer* (London), June 5, after *American Machinist.*

Number of Electric Vehicles Used in European Countries

ACCORDING to a private census taken in March of this year a considerable increase is noted in Europe in the use of electric vehicles for municipal utility purposes, and the distribution of the vehicles in the different countries is given as in the appended table. Sixty street sprinkling and flushing carts in use in Berlin, some of them since 1907, are said to have demonstrated a yearly saving of about $400 over the cost of the same work with horses as the motive power, and the use of electric tricycles for mail collections is being expanded yearly in Berlin, Vienna, Copenhagen and other large cities.—From *Allgemeine Automobil-Zeitung*, May 30.

ELECTRIC VEHICLES OPERATED IN EUROPE, MARCH, 1914

Countries	Pleasure Vehicles	Freight Vehicles	Pleasure Tricycles	Business Tricycles	Totals
Germany	862	554	3	270	1689
Holland	70	38	1	6	115
Denmark	2	21	....	5	28
Sweden	2	2	....	2	6
Austria-Hungary	132	117	1	15	265
Belgium	1	....	....	....	1
France	100	190	....	28	318
Russia	3	4	....	1	8
England	201	62	....	25	288
Switzerland	131	69	....	....	200
Roumania	....	....	....	1	1
Spain	12	....	....	1	13
Italy	60	173	....	5	238
Totals	1576	1230	5	359	3170

Races for Improving the Springs of Ordinary Cars

ON THIS subject, now coming to the front, *The Motor* (London) writes substantially as follows: "There is one particular in which there is still much to learn and room for much improvement—the springing. The course over which the Tourist Trophy Race is to be held is not an easy one on springs at best, and it will certainly provide a good test at high speeds of both springs and tires. Naturally every entrant firm has taken the greatest care to make the springing of its cars as nearly perfect as may be, and various expedients in the nature of shock absorbers and rebound dampers will be universally resorted to; but, so far as we are aware at present, there is to be no radically new or different system of suspension tested, which is rather a matter for regret in view of the undoubted great scope for improvement in this direction. One has but to note the number of palliatives offered in the advertising pages of the motor journals to realize how far from perfection is the suspension of cars, and the use of such fittings on racing cars should provide valuable information for those who are in a position to obtain first-hand knowledge of how they operate in practice. Here again, though, racing and everyday conditions are at variance, and the lessons of racing cannot be applied to touring cars without the most careful consideration and weighing up of fancies and sorting out of facts."

[A contribution in the matter of answering the question, whether a spring suspension found superior for racing cars should also be suitable for ordinary driving speeds, is perhaps supplied through the tests made by Dr. Bobeth in Germany, who found that, so far as the two vehicles at his disposal were concerned, the worst oscillations of the chassis occurred at a speed of about 22 kilometers per hour. This result was of course due to the fact that at higher speeds the forward movement enters as a stronger factor to change the resultant of the forces due to spring action and gravitation and flattens out the trajectory described by the car body, so that its movements are felt in lesser degree as a succession of shocks. On the other hand, it apparently does not mean that the violence of the shocks absorbed in the springs was not greater at the higher speeds. Also, Dr. Bobeth's observation did not apply to shocks received from abnormally great road obstructions. Taking the two facts together, that high speed makes riding easier on a road of average roughness but increases the shocks which the springs must endure, there seems to be some good reason for believing that the spring requirements are sufficiently alike for high and medium speeds to make the results of racing experience in this respect almost directly applicable to ordinary cars.—ED.]

Russian Development of Aeroplanes Makes History

THOUGH the current technical details in the evolution of aviation lie beyond the scope of these columns, a note on the large lines of division which are becoming visible in this development in Europe may be of interest. So far the French monoplanes, according to Herbert Hinderscheidt, one of the engineers at the German aviation camp at Adlershof, have excelled in speed, reaching an average of 120 kilometers per hour, while German monoplanes of the very reliable but heavier "Taube" type do not get far beyond 90 kilometers. On the other hand, German biplanes have now been so perfected that their speed about equals that of the light French machines while their carrying capacity is much superior. During the Balkan war these biplanes proved themselves far more useful than the monoplane. But, after all, no great principle is involved in the relative merits of these types. It is the mammoth aeroplanes of the Russian army, designed by Sikorsky, that have taken the technical world by surprise. An entirely new type was here created, and the first machine showed wonderful results, despite the designer's lack of experience in building and operation. It worked much more economically than any previous aeroplane, left the ground at first trial and turned curves and spirals with perfect ease. Immediately thereafter Sikorsky, assisted by the government, built a second model which showed such qualities that the government at once ordered six more at a price of $500,000. This type is called the Ilija Muromets.

It has 4 motors of 100 horsepowers each and weighs 3,500 kilograms. At first trials it caried 15 persons and a payload of 1,300 kilograms. Its speed with this load was 100 kilometers per hour.—From *Der Motorwagen*, June 10.

SPOTWELDING IS NOT YET PRACTICAL, according to Otto Fuchs of Brünn, Austria, a specialist in welding and riveting, for uniting two metals of widely different fusion points; it is not yet developed for use with aluminum, though frequently good welds can be accomplished, and in practice autogenous welding is used for aluminum at the same factories where spotwelding is used for iron and steel. As an improvement on riveting, spotwelding is far more economical, speaking about sheet steel and iron, and gives greater average strength, but the results depend somewhat more on the ability and care of the workman.

The Cyclecar vs. the Light Car

Cyclecar Movement Not Absorbed by Light Car Activity—A Definite Field

By William B. Stout

THERE is a very much growing idea that the cyclecar movement is going to emerge as a light car enthusiasm, and that the cyclecar, so called, will thereby be a thing of the past.

This feeling is not without foundation, for those in touch with cyclecar developments see a great change coming over the whole movement, a reaction from the first burst of enthusiasm, which was predicted long before it came.

The idea of the cyclecar movement was to produce the cheapest possible motor vehicle, and it has been superseded because the cyclecar in its first forms has proved itself worthy of better constructions than had been given it at the start and because mechanisms of few parts have not proved as reliable nor as cheap to build and buy as more standard and more complicated parts.

Public Slow to Buy

Another point having a decided bearing has been the slowness with which the public accepted the cyclecar idea to the extent of actual buying. They enthused, they gathered in crowds to watch, they expressed enthusiasm, and they predicted wonderful things, but those who bought went to cars of automobile standards, and of those who enthused on cyclecars the most had little money to buy.

As a result, makers are taking to four-cylinder water-cooled motors, shaft drive and gearsets and live axle constructions. They are entering the light car field, with its sociable seating and its higher first cost and the public thinks the cyclecar movement has perhaps failed.

Cyclecar Movement Has Hardly Started

As a matter of fact the cyclecar movement has hardly started. Makers started to experiment with cyclecars and yet could not forget the automobile. They added this and they added that, and when all was done the cars weighed 800 pounds instead of the 450 they started out to reach, and this weight was to be driven by a motorcycle motor. The wonder was that motorcycle motors did handle this weight and are handling it to-day. The best of these V-motored cars are running satisfactorily, but only on those cars where there has been real workmanship. Some of them were so cheaply built that they did not last at all. These are the ones which have harmed the cyclecar movement and have set it back.

The cars produced were to sell at under $400, and did. They did not sell in the quantities expected, however, as when this price was paid the buyer wanted a motor car, and as light cars at this figure were produced at about the same time, the public bought the light car first. The cyclecar is still in embryo.

V Motors Cost Too Much to Build

A great reason for the change to four-cylinder plants was that the V motors available were too costly to build to enable their makers to make a price on them consistent with the performance. They were fast but they would not run slow; they had low fuel consumption and great noise, and the public was afraid of air cooling. All of this hindered sales, while in fact the motors were doing wonderful work. Only recently the writer drove a V-motor cyclecar on a straight stretch of concrete road near Detroit in a race with a car which was an exact duplicate except that it was fitted with a four-cylinder, much larger motor, and beat it easily. On a hill or in sand, however, the V motor would have been the loser, as it was pulling 950 pounds.

Cyclecars Should Weigh Under 500 Pounds

There is but one field for the cyclecar, and that is in the simple light class. The car should not weigh over 500 pounds, and should have a low gear ratio to the motor. This motor can be back of the rear seat and connected to the solid axle by a chain and motorcycle clutch on the motor shaft, without gearset. If there is a gearset it must be friction or its equivalent, light and very cheap; but exceptionally well built. The body should be very light, and be a single seater with perhaps a spare folding seat for a passenger when wanted. All of this must be on the basis of ultra simplicity and the selling cost must not be over $275, preferably to be paid on the installment plan. It would then appeal to a class between the motorcycle and light car and have a niche to fill.

To build this car certain things must be done, however. In the first place motors must be simplified. A V-type motor should be simpler than a four-cylinder, but at present they have more complication instead of less, due to the built-up crankshaft and the crankcase constructions. If the extreme of simplicity is sought the two-cycle motor should be thought of in the single-cylinder or two-cylinder type, as this is the cheapest of all to build and with friction drive should be flexible enough for a $250 car.

Simpler types of car are possible, and probable, and will have as wide a field of sale as the motorcycle and probably much wider.

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Large Registrations in Indiana and Ohio

INDIANAPOLIS, IND., June 27—The Indiana Secretary of State is now issuing motor car licenses at the rate of 150 a day, and most of these are going to rural districts and small towns. There were 53,511 motor-car licenses issued from January 1 to June 15, inclusive. In 1913 there were about 45,000 licenses issued. Licenses on second-hand cars are being transferred at the rate of from ten to twelve a day.

According to a report issued by J. A. Shearer, state registrar of automobiles of Ohio there were 102,000 automobiles registered up to June 16. Chauffeurs to the number of 3,700 had been registered. Registrar Shearer estimates a registration of 115,000 automobiles, 25,000 motorcycles and 10,000 chauffeurs.

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Iowa's 1914 Car Valuation, $115,000,000

DES MOINES, IA., June 27—Iowa will have $115,000,000 invested in automobiles at the close of the year 1914. This is the estimate of the state automobile department from figures compiled on the basis of registration to date. This will mean that the automobile wealth of the state will be just twice as great as it was in 1913. Over 86,000 automobiles already have been registered in Iowa this year. The entire registration for last year was only 65,000. Thus the number already registered for 1914 is 21,000 in excess of the total for 1913. State officials make a conservative estimate based on former years that the total registration for this year will be 115,000. If the average valuation is $1,000 the total value of all the cars in the state will be $115,000,000.

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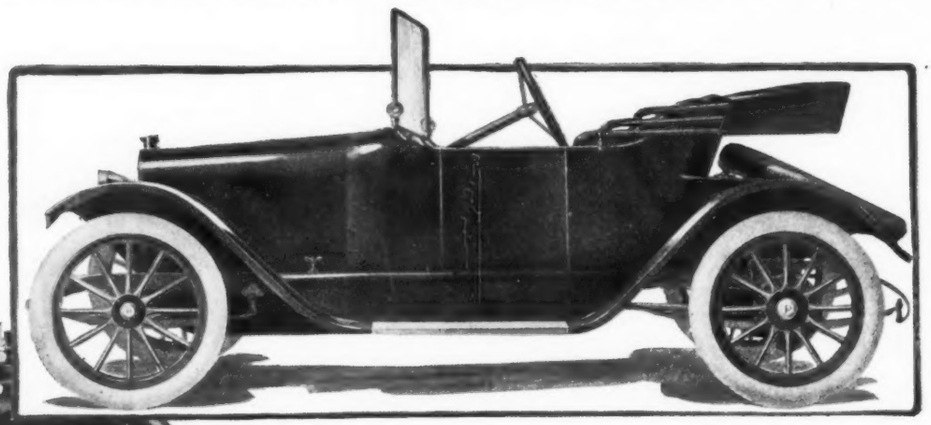
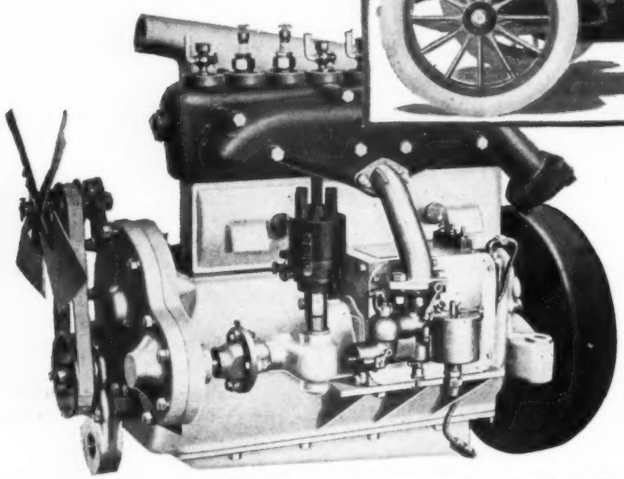
PONTIAC, MICH., June 27—J. Ward Robbins, formerly with the General Motors Co., of Detroit, and Pontiac, will open the first garage in Clarkson, Mich., this week. He will secure the agency for a medium price car.

$495 Partin-Palmer Has Generator

New Streamline Roadster Has Full Equipment, Three-Speed, Gearset and Self-Starter for $75 Extra



New Partin-Palmer two-passenger roadster



Right side of motor, showing generator, unisparker, simple piping and suspension arms

FOUR hundred and ninety-five dollars is the rather astonishingly low price of the new Partin-Palmer runabout with two-passenger body, considering that this figure includes a Gray & Davis lighting system, electric horn, windshield, top, tire case and tools. The car is equipped with a graceful streamline body, has a four-cylinder motor rated at 22 horsepower and it is stated that the machine will travel from 30 to 35 miles on a gallon of gasoline. It is to be known as model 20 and is designed for the 1915 season. It is made by the Partin Mfg. Co., Chicago, Ill.

Left drive and center control are used and another feature is the listing of a Gray & Davis self-starter at $75 additional. Double electric headlight bulbs, controlled from the cowl board are used and the tail light has a small electric bulb.

The motor is a clean-cut design with the four cylinders, which are of the L-head type, cast in a block. The bore is 2.75 inches and the stroke 4 inches. The intake and exhaust manifolds are, however, cast separately. The valves are inclosed and the piping is simple, which not only gives a neat looking motor but allows easy access to the valves. Three-point suspension is used, one point at the front and two at the rear.

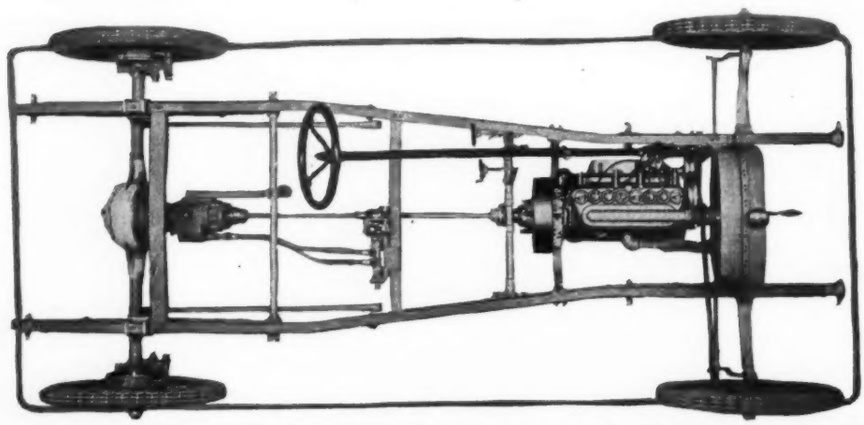
Ignition is furnished by an Atwater Kent Unisparker that is supplied with current either from the generator or the storage battery. The Unisparker and generator are both located on the valve side of the motor and are driven from a single lay shaft. The shaft of the Unisparker is vertical and it is driven from the lay shaft by means of a pair of bevel gears.

The crankcase is an aluminum casting and carries the crankshaft which is a drop-forging, made from heat treated carbon steel. The camshaft is also a drop forging, made in one piece. All reciprocating parts are carefully balanced to reduce vibration to the minimum.

Lubrication is by a combination splash system in which oil is provided by a plunger pump.

Cooling is effected by the use of a thermo-syphon system in connection with a honey-comb radiator and ball bearing belt driven fan.

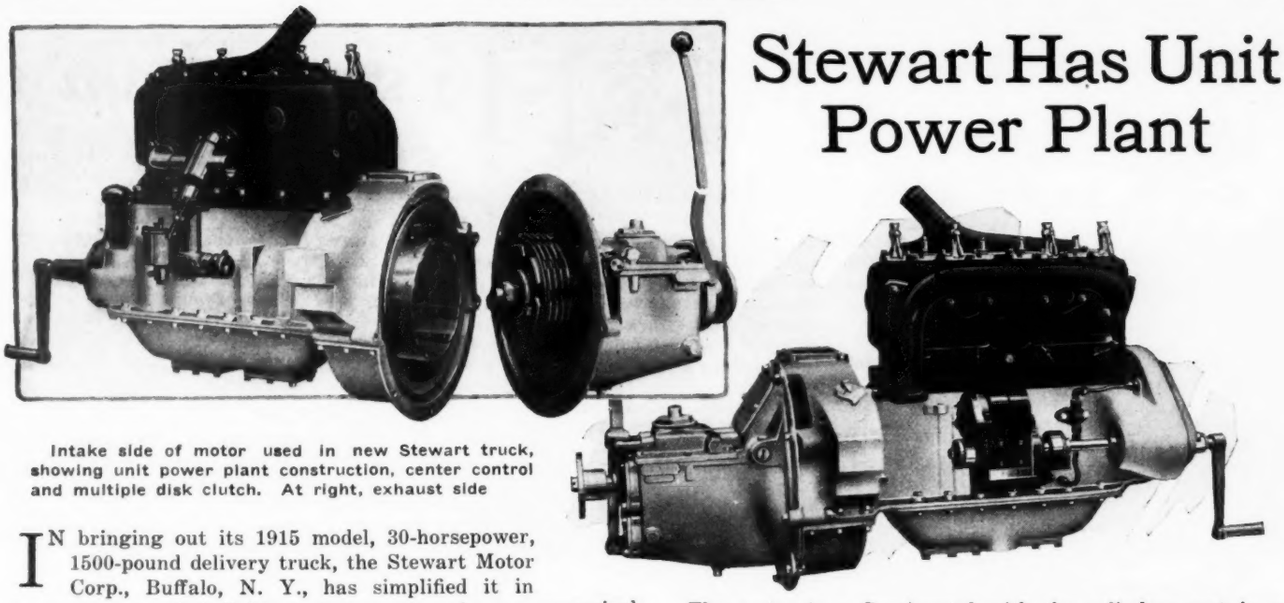
Drive from the motor is taken by a leather-faced cone clutch which is held in engagement by four coil springs. Access to the gearset on the back axle is readily had through removable side covers. Chrome nickel gears are employed and the shafts turn on annular ball bearings. An adjustment is provided for setting the driving pinion into proper mesh with the big bevel gear and there are adjusting nuts on the shifting rods.



Plan view of chassis, showing suspension of motor, cone clutch and integral gearset and rear axle

As already stated, the rear axle is a full-floating design the weight being carried entirely on the axle housing and the drive shafts merely turning the wheels. The drive shafts are made from nickel steel and heat treated. Annular ball bearings are supplied at the outer ends of the rear axle, while Hyatt rollers are used on either side of the differential. The end thrust is taken care of by ball bearings.

Stewart Has Unit Power Plant



Intake side of motor used in new Stewart truck, showing unit power plant construction, center control and multiple disk clutch. At right, exhaust side

IN bringing out its 1915 model, 30-horsepower, 1500-pound delivery truck, the Stewart Motor Corp., Buffalo, N. Y., has simplified it in many ways, made it lighter yet stronger, and more economical to operate.

To begin with there are 500 less parts and by the use of refinements in the general motor and chassis design 25 per cent. more mileage for the same amount of gasoline and oil is obtained.

A unit power plant with three-point suspension is now used, this construction embracing a four-cylinder motor, inclosed disk clutch and sliding gearset. Left drive and center control are continued. The frame side members have been made perfectly straight so that their strength is a maximum and the fitting of the body is also facilitated by this change. Thermo-syphon cooling has been substituted for pump-circulation and fuel economy and increased power are the result of water-jacketing the intake manifold.

One other change is noted in the cooling system. Last year the circulation of air through the radiator, which is mounted on the dash, was aided by fan spokes in the flywheel, but suction is now produced by a belt-driven fan. A glass windshield has been added to the regular equipment, thus not only giving protection to the driver, but adding to the appearance of the car. Aluminum panels have displaced wood in the body construction. A Westinghouse electric starting and lighting outfit is furnished as extra equipment.

A feature of the new truck is that all important units are quickly and easily removable.

Only one chassis model is manufactured, but it is equipped with many styles of bodies. The price of the chassis is $1,500 and the bodies are extra, varying from $125 to $850.

The motor is a Continental with the cylinders cast in a block and the valves are on the right side. The bore is 3.5 inches and the stroke 5 inches, and it is rated at 30 horsepower. The exhaust manifold is separate and has individual passages leading from the four cylinders. The carbureter is a Zenith and is situated on the left side of the motor, the intake passage being cored through the cylinder casting.

The oiling system is a force-feed, constant-level type. A plunger pump operated by an eccentric cam on the camshaft forces the oil to the various motor parts. Ignition is supplied by a Bosch DU4-2 situated on the valve side of the motor.

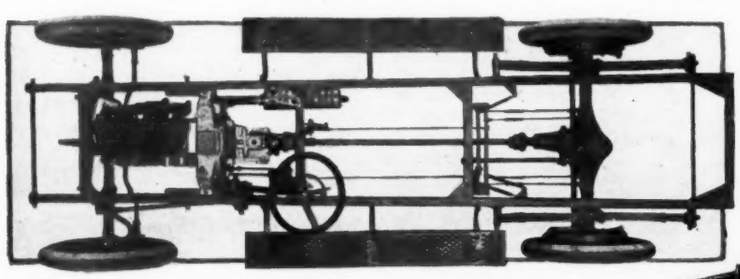
The clutch is a dry plate, multiple-disk type, contained in the flywheel, with one set of steel plates and another set of Raybestos-lined steel plates. There are nine plates in all and the surface is 230 square inches.

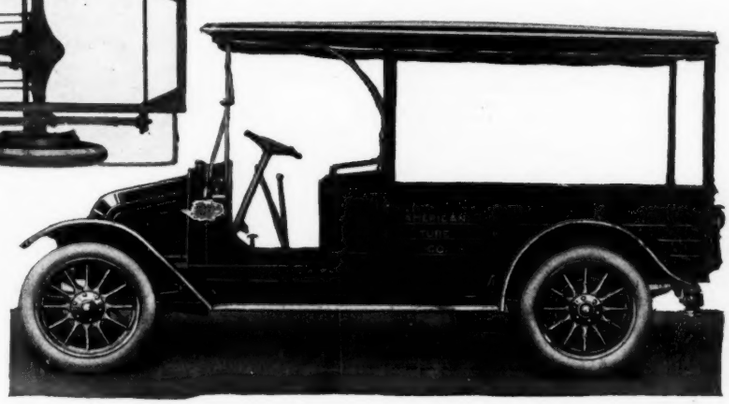
The gearset is a sliding type, affording three speeds forward and one reverse. It bolts directly to the bell-shaped housing that incloses the flywheel and clutch.

There are two universals in the drive shaft and the rear axle is a floating construction of Timken make. The gear ratio is 5.5 to 1. The front axle is also of Timken design.

The steering gear is a worm and sector which permits of bringing a new quarter of the worm wheel in contact with the worm when it becomes worn. A feature of the steering mechanism is a ratchet control on the steering post to prevent slipping due to road shocks and vibrations.

Semi-elliptic springs are used front and rear, and 34 by 4.5-inch pneumatics fitted with Firestone quick-detachable, demountable rims are standard. An extra rim with a carrier is included and also a tool kit, tire pump, jack and repair outfit.





Above—Plan view of chassis used in new Stewart truck, showing unit power plant, left drive and center control and simple construction. The new truck is said to have 500 less parts than the old model. At the right is shown the truck fitted with an open express body. Note housing of radiator in extension of dash cowl

Factory Miscellany

NEW Million-Dollar Factory—Work has begun on the $1,000,000 plant on Thomson avenue, Long Island City, for the American Ever Ready Co., a branch of the National Carbon Co., Cleveland, O., and it is expected to have the building completed and ready for occupancy by February, 1915. The structure will be 200 feet by 300 feet, and eight stories in height. It will be of reinforced concrete throughout with concrete floors, metal doors and window frames and will have over 500,000 square feet of floor space. The plant will give employment to 2,000 persons. The company's output of batteries, lamps, flashlights, speedometers, automobile starters and other automobile supplies amounts to about $5,000,000 per year. The company's plot, which is on the Degnon Terminal Co.'s improvement tract, occupies an entire block, 600 feet front on each Manley and Orton streets and 200 feet on Thomson avenue and Manley street. It is expected the plant will before many years be enlarged to take in the entire block. The plant at Long Island City will be made a distributing center as well as a main factory for the company's goods.

Auto Body Co. Adds—The plant of the Auto Body Co., Lansing, Mich., will be enlarged, permission having been granted for the erection of a three-story brick building.

Blood Bros. Will Enlarge—The plant of the Blood Bros. Machine Co., of Kalamazoo, Mich., will be enlarged, the addition to be used as the assembling plant for the cyclecars which the concern is now making.

Three Crescent Cars Built—The Crescent Motor Car Co., St. Louis, Mo., who about six months ago opened a factory there, has three stock cars ready for delivery. The name of the car has been changed from Crescent to Superior.

American Metal Products Co. Working—The American Metal Products Co., Milwaukee, Wis., organized recently to engage in the manufacture of bronze die castings, has started operations in part of the brass foundry of the defunct Wambold Mfg. Co.

Detroit Tire Plant in Springfield—The Detroit Pneumatic Tire Co. has been organized in Detroit, Mich., and will manufacture tires. The plant is now being erected in Springfield, Ill., but headquarters are for the time being at 915 Ford Bldg., Detroit.

Will Manufacture Rims—The Lookout Bending Co., Chattanooga, Tenn., recently organized, will soon be ready to commence operations near Sulphur Springs, Ga. The factory is now being erected in which automobile wheel rims and spokes will be manufactured. F. S. Baumgartner is president.

216,056 Goodyear Tires in April—During the month of April the Goodyear Tire & Rubber Co., Akron, O., produced a total of 216,056 pneumatic tires. Of this number 186,491 were automobile tires and 29,565 were motorcycle tires. The total number of automobile tires for the fiscal year, to the first of May, was 699,342.

Baltimore Co. Will Move—The Baltimore Hub, Wheel & Manufacturing Co., Baltimore, Md., has leased the Hitchens storage warehouse at Saratoga and Holliday streets, to which it will remove its factory for carriage, wagon and automobile wheels from its present location on Harford avenue, which it sold to the McShane Bell Foundry Co.

Miller Rubber's New Factory—The Miller Rubber Co., in Akron, O., has purchased the factory of the Frantz Body Co., which is located just to the north of the present factory. It is the plan to tear down the old buildings and erect a modern fireproof factory building. It is planned to build a new warehouse in the rear of the present factory building also.

Will Manufacture Springs—Springs for automobiles and other vehicles will be made by the Pallau Steel Co., which has been organized in Mt. Clemens, Mich., with a capital stock of $75,000, of which $60,000 has been subscribed. A. T. Donaldson is president of the new concern; A. J. Pallau, vice-president, and Clifton D. Jackson, secretary-treasurer. Mr. Pallau was during many years an official of the Detroit Steel Products Co.

Continues Ford Belt Manufacture—The C. & B. Hinson Co., Liddell and Grove streets, Cincinnati, O., has recently been purchased by E. P. and M. A. Zachman, who will continue to operate the company under its old firm name of the C. & B. Hinson Co. at 2717-2719 Webster avenue. The above parties will continue to specialize in Ford endless fan belts, which are made of linen and cotton fabric tape, put together by special machinery. They have equipped their factory with machinery that will enable them to not only make a four-ply but also a five-ply belt.

The Automobile Calendar

July 2, 3, 4.....Denver, Colo., 270-Mile Consistency Race.
July 3-4.....Tacoma, Wash., Montamara Festo Races, Tacoma Speedway Assn.
July 3-5.....Denver, Colo., All-Colorado Auto Derby. Denver Motor Club.
July 4.....Utica, N. Y., Hill Climb, Auto Club of Utica.
July 4.....Visalia, Cal., 150-Mile Road Race.
July 4.....Prescott, Ariz., Road Race, Prescott Auto Club.
July 4.....Sioux City, Iowa, 300-Mile Race, Sioux City Auto Club and Speedway Assn.
July 4.....Lyons, France, French Grand Prix.
July 4-5.....Chicago, Ill., Track Meet, Hawthorne Track.
July 13-14.....Seattle, Wash., Track Races, Seattle Speedway Assn.
July 25-26.....Belgium Grand Prix Road Races.
July-August.....French Army Truck Subsidy Trials.
Aug. 1-3.....Galveston, Tex., Beach Races.
Aug. 2-9.....Grenoble, Automobile Club of France's 6-Day Motorcycle and Cyclecar Reliability Contest in French Alps.
Aug. 16.....Le Mans, France, Automobile Club de la Sarthe's Coupé International Light-Car Race, 1 liter, 400 maximum cylinder area, 350-500 kilos weight.
Aug. 17.....Le Mans, France, Auto Club de la Sarthe's Grand Prize de France for 4½ liter cars.
Aug. 21-22.....Chicago, Ill., Elgin Road Races, Chicago Automobile Club.
Aug. 23.....Auvergne, France, Coupé de l'Auto Race.
Aug. 27.....Brooklands Track, England; Annual Automobile Race.
Aug. .....Denver, Colo., 650-mile Run, Colorado Springs to Salt Lake City.
Aug. .....Russia, Road Race, Coupe de l'Empereur, 2,500 miles.
Sept. 6-7.....Brescia, Italy, Auto Club of Italy's 4½-liter Grand Prize.
Sept. 6-7-8.....Newark, N. J., Cyclecar Reliability Tour to Atlantic City.
Sept. 7-14.....Indianapolis, Ind., Automobile Show, Indianapolis Automobile Trade Assn.
Sept. 9.....Corona, Cal., Road Race, Corona Auto Assn.
Sept. 10.....Portsmouth, Eng., Autumn Conference, Institute of Metals.
Sept. 10-15.....Berlin, Germany, German 4½-liter race.
Sept. 15-Oct. 11..New York City, Commercial Tercentenary Celebration.
Sept. 26.....Brooklands Track, England, Annual Automobile Race.
Sept. 26-Oct. 6...Berlin, Germany, Automobile Show.
Oct.....Philadelphia, Pa., E. V. A. A. Annual Convention.
Oct. 7-17.....New York City Electric Vehicle Show, Grand Central Palace.
Oct. 9-Nov. 2....S. A. E. European Trip.
Oct. 16-26.....Paris, France, Automobile Salon.
Oct. 17-24.....Pittsburgh, Pa., Automobile Show, Auto Dealers Assn., Inc.
Oct. 19, 20, 21....Philadelphia, Pa., Elec. Veh. Assn's Convention.
Oct. 19-26.....Atlanta, Ga., American Road Congress of the American Highway Assn. and the A. A. A.
Oct. 28-31.....Milwaukee, Wis., Convention, Northwestern Road Congress, Auditorium.
November .....El Paso, Tex., Phoenix Road Race, El Paso Auto Club.
Nov. 6-14.....London, England; Olympia Show.
Nov. 8-9.....El Paso to Phoenix, Ariz., Automobile Race.
November 8-11...Shreveport, La., Track Meet, Shreveport Auto Club.
November 15.....Paris, France, Kerosene Motor Competition.
Jan. 2-9.....New York City, Annual Automobile Show, Grand Central Palace.
Jan. 23-30.....Chicago, Ill., Automobile Show, First Regiment Armory.

The Week in the Industry

Motor Men in New Roles

MILLHOFF General Sales Manager—F. C. Millhoff, formerly tire sales manager of the Miller Rubber Co., Akron, O., has been appointed general sales manager.

Lynch General Manager—Leigh Lynch has become general manager of the American Top Co., Jackson, Mich., and Tilbury, Mich.

Booth with Universal Truck—N. Booth, formerly general manager of the Studebaker Corp., Detroit, Mich., is now with the Universal Motor Truck Co., Detroit.

Roark Appointed District Manager—J. F. Roark, formerly with the Cole concern, has been assigned as district manager of the St. Louis, Mo., district for Dodge Bros., of Detroit.

Spencer Gets Promotion—J. E. Spencer, of the Studebaker Corp., has been appointed assistant to First Vice-President A. R. Erskine, of the Studebaker concern, with headquarters in Detroit, Mich.

Willis Leaves National—P. P. Willis has resigned as advertising manager of the National Motor Vehicle Co., Indianapolis, Ind. He became a member of the advertising firm of Thompson-Carroll-Tripp of Cleveland July 1.

Arbogast Cole Manager—E. E. Arbogast has been appointed manager of the Cole Motor Co. of Missouri, St. Louis, to succeed Nelson W. Gotshall, resigned to take active charge of other personal interests. Mr. Arbogast formerly was connected with the Cole company at Indianapolis in both engineering and sales capacity.

Wagner with Century Electric—E. Wagner, an old-timer in the electric vehicle trade, has become associated with the Century Electric Co., of Detroit. He will direct his efforts in building up the efficiency of the sales and service branches in the national field and will organize a department for assisting dealers.

Clifford Sails July 8—J. E. Clifford, for the past 2 years representative of the General Motors Export Co. at the Buick factory at Flint, Mich., will sail from Vancouver July 8 on the steamer "Makura" for Sydney, Australia, to take general management for Australia and New Zealand. Buick business in this territory last year was about 1,000 cars.

Buffalo Electric's New Appointments—W. A. Zimmerman, formerly secretary and general manager of the Mercury Mfg. Co., has been made director of sales and publicity for the Buffalo Electric Vehicle Co., Buffalo, N. Y. F. C. Brown, formerly district manager for the Chase Motor Truck Co., has been made sales manager of the truck department of the same company.

Leaves for International Rubber Congress—Dr. K. J. Thompson, chief chemist of the Federal Rubber Mfg. Co.'s laboratories at Cudahy, Wis., recently left for Europe to attend the rubber auctions in Liverpool, Antwerp, Hamburg and London, also to attend the International Rubber Exhibition and Congress to be held in London June 24 to July 9.

Kiesewetter Houk Advertising Manager—The Geo. W. Houk Co., Buffalo, N. Y., announces the appointment of H. M. Kiesewetter, formerly of the Michelin Tire Co., as advertising manager and manager of its New York branch, located at the northeast corner of Fifty-eighth street and Broadway, from which office all Houk wire wheel business in Greater New York is being handled.

Jarrard on Western Trip—T. E. Jarrard, vice-president of Apperson Bros. Auto Co., Kokomo, Ind., is engaged in an extensive business trip through the West, visiting the largest distributers west of the Mississippi River. His desk at the main offices in Kokomo is being occupied by W. Carl Parker, of the Chicago branch. James Apperson, traveling representative of the company in the Great Lakes district, has assumed Mr. Parker's regular duties in the meantime.

Johnson Remy's Foreign Representative—The Remy Electric Co., Anderson, Ind., has closed negotiations with W. H. Johnson, 60 Haymarket, London, England, who will represent the Remy company in the capacity of manufacturer's agent in Europe. Mr. Johnson will also open a completely equipped service station to take care of all users and dealers of Remy products on the Continent.

Henderson Leaves Baker Co.—O. B. Henderson, sales manager of the pleasure car department of the Baker Motor Vehicle Co., Cleveland, O., on account of personal interests on the Pacific Coast which demand his constant attention will sever his connection with this company. Mr. Henderson leaves the latter part of this month to take up his permanent residence in Los Angeles.

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Garage and Dealers' Field

King Co. Entertains Manufacturers—The King Motor Car Co., Detroit, is entertaining during two days at its cottages at Lake Orion, Mich., seventy parts manufacturers and other officials of the King company.

American Distributing Co. Moves—The headquarters of the American Distributing Co., general sales agent for automobile parts manufacturers, have been removed from Jackson, Mich., to the Goldberg Building, Woodward avenue, Detroit.

Bids on Richard Plant Opened—Bids will be opened soon by the Richard Automobile Co., Cleveland, O., for the erection of a large plant just off Broadway near the belt line railroad. The structure will be almost completely enclosed with glass. It is planned to have the plant completed in 3 months.

Michigan Building at Exposition—The Reo Motor Co., Lansing, Mich.; the Paige-Detroit Motor Co., the Fisher Body Co. and the Metal Products Co., all of Detroit, have each contributed $250 toward the fund for the construction of a Michigan building at the Panama exposition. These were the first large contributions received for the purpose.

Montreal's Record Shipment—What is believed to be the record for the number of automobiles taken on a single ship from Montreal will be exported on the Anglo-Egyptian steamer of the New Zealand Shipping Company when she cleared from Montreal on June 20. She took no less than 400 cars, including both runabouts and touring machines.

New Ford Service Bldg.—The Ford Motor Co., of Canada, Ltd., will build a general service building which is now in the course of construction in Montreal, Que. The building is of concrete construction, four stories in height, occupying a lot approximately 160 feet square, which would give a floor space of something over 100,000 square feet. It is expected that it will occupy the new building about the first of October.

Service Station to Be Opened—The Twombly Car Corp. is about to convert its four-floor experimental laboratory, which it has maintained at 258 West Sixty-ninth street for several years, into a service station. The experimental laboratory will be moved to the new Twombly factory at Nutley, N. J., at an early date. This laboratory is solely devoted to the inventing and testing of improvements for Twombly cars.

Westinghouse System on Dorris—The Westinghouse Electric & Manufacturing Co. announces that the Dorris Motor Car Co., St. Louis, Mo., has adopted the Westinghouse electric equipment for starting, lighting and ignition on 1915 cars. This equipment consists of a combination ignition and lighting generator together with a complete complement of switches, fuse boxes, junction boxes, and starting motor with switch and ammeter.

Co-operative Motor Delivery—Merchants of Waukesha, Wis., have decided to give a co-operative motor delivery system a 60-day trial. Charles Hamm, a dealer at Waukesha, who operates a motor truck line, is behind the scheme and has assured the merchants that he can effect a saving of 20 per cent. in their delivery costs. A central distributing station will be established and three deliveries will be made in the morning and two in the afternoon. This will be the first attempt in any Wisconsin city to test the merits of the co-operative system.

Oldsmobile Agent's Three Branch Stores—C. H. Larson, New York City, dealer in Oldsmobiles, has ordered a large number of the small four-cylinder cars from the factory, and in order to sell them he has hit on a plan new to Automobile Row. This is to establish three temporary showrooms in addition to his own in West Fifty-eighth street, where sample cars may be seen and where orders may be taken. One store is at the southwest corner of Fifty-seventh street and Broadway. Another is in the Hudson Terminal Building and the third is to be on a busy and prominent corner in the Bronx.

Recent Incorporations in the Automobile Field

AUTOMOBILES AND PARTS

BOSTON, MASS.—L. M. Cotton; capital, $50,000; to deal in automobiles. Incorporators: F. E. Crowford, A. M. Cussen.

BOSTON, MASS.—Motor Economy Co.; capital, $10,000; to deal in automobile supplies. Incorporators: Philip K. Farrington, Newton, John W. Smith.

BROOKLYN, N. Y.—John P. Agnew; capital, $5,000; to deal in automobiles and supplies. Incorporators: Robert B. Agnew, John P. Agnew, Annie T. Maude.

CHATTANOOGA, TENN.—Forstner-Shackelford Co.; capital, $5,000; automobiles. Incorporators: Ernest W. Forstner, Chas. C. Shackelford, Chas. A. Ryerson.

CHICAGO, ILL.—Danielson Engine Works; capital, $50,000; to manufacture automobile parts and accessories. Incorporators: F. Danielson, E. T. Runyan, R. Williams.

CHICAGO, ILL.—Duryea Motor Sales Co.; capital, $100,000; automobiles. Incorporators: A. P. Cambell, V. H. Stackwell, J. E. Packer.

CHICAGO, ILL.—Flex-Spring Co.; capital, $5,000; to manufacture automobiles and sell automobile parts and accessories. Incorporators: Thomas R. Beman, Albert F. Mecklenburger, Ward B. Sawyer.

CHICAGO, ILL.—R. H. Lyon Co.; capital, $2,500; to deal in and repair automobiles. Incorporators: Franc D. Mayer, Selma G. Mayer, Walter Herschman.

CLEVELAND, O.—Jiffy Jack Co.; capital, $50,000; to manufacture and sell automobile parts and accessories. Incorporators: J. P. Engle, E. K. Harpster, M. F. Thompson, E. A. Edwards, N. B. Wildman.

CLEVELAND, O.—Packard Cleveland Motor Co.; capital, $40,000; to deal in automobiles. Incorporators: J. L. Cannon, C. W. Fuller, W. A. McIlrath, H. E. Werner, E. E. Linden.

COLUMBUS, O.—Swarts Carbureter Co.; capital, $50,000. Incorporators: M. A. Corbett and others.

INDIANAPOLIS, IND.—Comet Cyclecar Co.; capital, $20,000; to manufacture and sell cyclecars. Incorporators: F. P. Mertz, L. F. Mertz, W. H. Ogborn.

GREENSBORO, N. C.—R. G. Sloan Motor Co.; capital, $25,000; to deal in automobiles. Incorporators: R. G. Glenn, F. P. Hobgood, R. G. Sloan.

HAMILTON, ONT.—Wentworth Motors, Ltd., capital, $40,000; to manufacture motor cars and trucks. Incorporators: D. B. Wood, C. W. Heming.

HARTFORD, CONN.—Greenlief Mfg. Co.; capital, $35,000; to manufacture automobile parts. Incorporators: George J. Long, W. H. Greenlief, John R. Hays.

HUBBARD, O.—Hubbard Auto Repair Co.; capital, $2,000; to deal in and repair automobiles. Incorporators: S. D. L. Jackson, H. T. McCarthy, A. H. Howatt, N. S. Logan, J. Boshin.

INDIANAPOLIS, IND.—American Underslung Co.; capital $50,000; to manufacture and deal in automobiles. Incorporators: C. M. Brown, A. W. Ogborn, E. Duncan.

NEWARK, N. J.—Boarem-Nicholas Motorcar Co.; capital, $100,000; to deal in automobiles. Incorporators: R. R. Boarem, Louis B. Thedand, J. Dykers Nichols.

NEW YORK CITY—Cook & MacConnell; capital, $1,500; automobiles. Incorporators: John MacConnell, Eugene T. Scudder, Benj. N. Scudder.

NEW YORK CITY—J. & P. Sales Co.; capital, $5,000; to manufacture motors. Incorporators: Jos. J. Miller, Walter L. Perley, Grace Feeney.

NEW YORK CITY—Physicians Automobile Co.; capital, $70,000. Incorporators: Geo. Maschke, Milton Elkan, Harry Elkan.

NEW YORK CITY—Meder-Staudt Co.; capital, $10,000; to manufacture and deal in engines, motors, etc. Incorporators: Philip F. Meder, Charles Meder, Charles Staudt.

NEW YORK CITY—William Woop Co.; capital, $25,000; to manufacture auto bodies, etc. Incorporators: Fernando Woop, Maurice A. O'Connell, Glenn M. Congdon.

NINEVAH, N. Y.—Ninevah Coach and Car Co.; capital, $15,000. Incorporators: George B. Raymond, Wm. A. Hyer, Frank L. Horton.

ORANGE, N. J.—Coppinger Motorcar Co.; capital, $5,000; to deal in automobiles. Incorporators: F. W. Coppinger, J. R. Monroe, Harry G. Dechant.

PERTH AMBOY, N. J.—New Era Auto Co.; capital, $50,000; automobiles. Incorporators: Alexander Conquest, Richard Henderson, Thomas Conquest, Perth Amboy.

RIPLEY, N. Y.—Burrows Cyclecar Co.; capital, $30,000; to manufacture cyclecars and novelties. Incorporators: J. W. Burrows, R. P. Burrows, Robert Burrows.

ROSSLYN, VA.—Carter Car Sales Co.; capital, $15,000; to deal in automobiles. Incorporators: Oscar A. Reed, W. C. Balderson.

SARANAC LAKE, N. Y.—Gray-Bellows Motor Co.; capital, $5,000. Incorporators: Earl L. Gray, Elbert E. Bellows, Fred T. Tremble.

ST. LOUIS, MO.—Car-Nation Motor Car Co.; capital, $10,000; to deal in automobiles and accessories. Incorporators: Odon Guitar, Frank B. Ottofy, Robert L. Guthrie.

ST. LOUIS, MO.—Champion Motor Car Co.; capital, $50,000; automobiles. Incorporators: A. R. Walton, O. A. Peters, F. D. McMahon.

ST. LOUIS, MO.—Vesper-Buick Auto Co.; capital, $50,000; automobiles. Incorporators: F. W. A. Vesper, Fred Campbell, F. E. A. Brock.

TORONTO, ONT.—Kel-Kee Cyclecar Co.; capital, $40,000; to manufacture power propelled vehicles, etc. Incorporators: J. J. MacLennan, J. N. Black, A. Adams.

WILMINGTON, DEL.—Cycle Car Co.; capital, $100,000; to deal in cyclecars.

GARAGES AND ACCESSORIES

BOSTON, MASS.—Motor Economy Co.; capital, $10,000; to deal in automobile supplies. Incorporators: Philip K. Farrington, John W. Smith.

BROOKLYN, N. Y.—Miller & Van Winkee; capital, $150,000; to manufacture metal springs and auto accessories. Incorporators: Clarence Miller, Edward M. Miller, Gilbert P. Brush.

BROOKLYN, N. Y.—Spencer Garage; capital, $5,000. Incorporators: James O. Spencer, Jr., Anne E. Spencer, Paul M. Weidmann.

BROOKLYN, N. Y.—Standard Garage; capital, $10,000. Incorporators: Domenico Saladino, August Quick, Auguste M. Quick.

BUFFALO, N. Y.—M. & M. Delivery & Garage Co.; capital, $20,000. Incorporators: George Roughhead, Reynold MacDonald, Maud MacDonald.

CHICAGO, ILL.—Alladin Electric Co.; capital, $10,000; to deal in electric and automobile merchandise, supplies, etc. Incorporators: Samuel P. Marmly, Jr., Norman C. Croshaw, Joseph Bonomo.

CLEVELAND, O.—Jiffy Jack Co.; capital, $50,000; to manufacture automobile accessories. Incorporators: J. P. Engle and others.

COLUMBUS, O.—Hubbard Auto Repair Co.; capital, $2,000; to deal in auto repairs. Incorporators: S. D. L. Jackson, H. T. McCarthy, A. H. Howatt, E. S. Logan, J. Boshim.

COLUMBUS, O.—Swartz Carbureter Co.; capital, $50,000; to make automobile accessories. Incorporators: E. A. Corbett, F. E. Stevens, R. J. Corbett, T. A. Swartz, L. S. Corbett.

DETROIT, MICH.—Johnson Co.; capital, $30,000; to manufacture automobile accessories. Incorporators: Walter R. Johnson, Chester T. Johnson, Irvin Long.

ELYRIA, O.—Cook Taxicab Co.; capital, $2,000; general taxi business. Incorporators: C. B. Cook, H. W. Ingersoll, F. N. Stetson, F. Vandermark, Frank Beebe.

E. ORANGE, N. J.—Reiss Starter Co.; capital, $200,000; to manufacture automobile starters. Incorporators: Charles Reiss, W. B. Riley, A. G. Causland.

JERSEY CITY, N. J.—Mutual Oil Co.; capital, $125,000; to deal in oils and other supplies for motor vehicles. Incorporator: E. B. Ryder.

JERSEY CITY, N. J.—Pell-Mello Horn Co.; capital $3,000; to deal in automobile accessories. Incorporators: W. S. Myers, Helen Myers, F. T. Wentworth.

MOUNT VERNON, N. Y.—Jacob Norden Inc.; capital, $10,000; to deal in auto supplies, etc. Incorporators: Max Jaeger, Jacob Norden, Sarah J. Forden.

NEWARK, N. J.—Washington Park Garage Co.; capital, $125,000. Incorporators: Gussie Devine, Arthur Devine, Jr., Paul F. Devine.

NEW YORK CITY—Anthony Benofrio & Co.; capital, $2,000; taxicab and garage business. Incorporators: Giovanina Benofrio, Anthony Benofrio, Jr., Antonio DeFio.

NEW YORK CITY—Equitable Garage; capital, $1,000. Incorporators: Harry Thal, Elizabeth Selnick, Henry Selnick.

NEW ORLEANS, LA.—Acme Automobile Co.; capital, $18,000; to deal in and repair automobiles.

NEW YORK CITY—Motor Gasket Co.; capital, $10,000; to manufacture motor gaskets, auto accessories. Incorporators: Clarence H. Loewenthal, Paul H. Loewenthal, Ralph M. Loewenthal.

NEW YORK CITY—National Auto Repair Co.; capital, $3,000. Incorporators: Edw. N. Grossman, Albert F. Tins, Walter Peppin.

NEW YORK CITY—Safety Taxicab Co.; capital, $1,000. Incorporators: Francis W. Russell, Grace U. Una, Francis Rosenblum.

NEW YORK CITY—Spartan Tire and Rubber Co.; capital, $100,000; to deal in automobile tires. Incorporators: H. L. Graffe, H. Feuchwanger.

PONKA, OKLA.—Ponca City Garage; capital, $10,000. Incorporators: W. H. McFadden, J. B. Hinkle, B. L. Hobbs.

ROCHESTER, N. Y.—Independence Tire & Rubber Co.; capital, $5,000. Incorporators: L. Walter Lissberger, Henry L. Lewis, Frank H. Gross.

ROCHESTER, N. Y.—Fox Taxicab Co.; capital, $6,000. Incorporators: P. Rothenbuescher, C. F. Buehlte, J. T. Fox.

SEATTLE, WASH.—Pacific Rubber & Tire Mfg. Co.; capital, $25,000; to manufacture automobile tires and tubes. Incorporators: B. L. Gates, C. A. Kilbourne and others.

ST. LOUIS, MO.—Airplex Inner Tire Co.; capital, $3,000; to deal in automobile tires, etc. Incorporators: Richard M. Howe, James H. Howe Stanton Palmer.

YOUNGSTOWN, O.—Auto Gas Service Co.; capital, $10,000; to deal in automobile supplies. Incorporators: J. P. McCombs, S. A. Daniels, W. R. Ludt, M. J. Daniels, A. K. Len.

CHANGE OF NAME AND CAPITAL

CHICAGO, ILL.—Motor Devices Co.; increase of capital from $3,000 to $25,000.

JACKSON, MICH.—E-C Clark Motor Co.; capital increased from $15,000 to $265,000.

JACKSON, MICH.—Lewis Spring & Axle Co.; capital increased from $350,000 to $750,000.

TOLEDO, O.—Universal Machine Co.; capital increased from $125,000 to $200,000.

Automobile Agencies Recently Established

COMMERCIAL VEHICLES

Place	Car	Agent
Belvidere, Ill.	Maxwell	J. W. Fox & Son
Boston, Mass.	Lyon-Knight	F. H. Gross Co.
Corsicana, Texas	Maxwell	A. R. & M. J. Lewis
Denver, Col.	Havers	Auto Livery Co.
Elizabethtown, Ky.	Hupmobile	J. Hayden Igleheart
Flemingsburg, Ky.	Ford	Dudly Garage
Forest City, Ill.	Maxwell	J. H. White
Franklin Grove, Ill.	Haynes	W. L. Sheap
Green Bay, Wis.	Haynes	Conley-Judd Motor Co.
Hattiesburg, Miss.	Maxwell	Hunter's Auto Rep. Wks.
Holbrook, Ariz.	Maxwell	Chas. L. Rhoton
Hopkinsville, Ky.	Ford	Ideal Motor Co.
Manitowoc, Wis.	Haynes	Marcus J. Rappe
Meridian, Miss.	Maxwell	Payne & Stevens
Merrill, Wis.	Haynes	Norman Chilsen
Milbank, S. D.	Maxwell	R. A. Berkner
New Philadelphia, O.	Lewis	Herbert Urfer
Paris, Tenn.	Maxwell	D. L. Burton
Pontiac, Ill.	Haynes	J. P. Cook & Co.
Providence, R. I.	Lyon-Knight	Elmwood Garage Co.
Shelbyville, Ill.	Maxwell	M. O. Finks
Tupelo, Miss.	Maxwell	Tupelo Implement Co.
Waynesville, Ill.	Maxwell	James & E. L. Dagley
Winchester, Ky.	National	W. Gardner Redmon

COMMERCIAL VEHICLES

Place	Car	Agent
Alliance, Neb.	Hercules	Lowry & Henry
Alma, Neb.	Hercules	Frank R. Furse
American Falls, Idaho	Hercules	A. W. Davis
Auburn, Me.	Koehler	Chas. A. Kimball
Anaconda, Mont.	Hercules	F. M. Osbourne
Antigo, Wis.	Hercules	P. F Kelly

PASSENGER CARS

Place	Car	Agent
Berkley Spgs., W. Va.	Hercules	E. L. Johnson & Co.
Big Timber, Mont.	Hercules	Baily & Severance
Billings, Mont.	Hercules	Jas. L. Markham
Bottineau, N. D.	Hercules	Jacob O hmart
Boulder, Col.	Hercules	Boulder Auto Co.
Brantford, N. D.	Hercules	Pattee & Prall
Bridger, Mont.	Hercules	W. E. Pinkney
Brush, Col.	Hercules	O. B. Fawcett & Son
Buford, N. D.	Hercules	W. W. Corbett
Cameron, W. Va.	Hercules	H. H. Pipes
Cape Girardeau, Mo.	Hercules	Jos. Lane
Carrington, N. D.	Hercules	G. C. Olsen
Casper, Wyo.	Hercules	Casper Mch. Shop & Gar
Chinook, Mont.	Hercules	J. C. Duff
Clark Summit, Pa.	Hercules	G. W. Secor
Cody, Wyo.	Hercules	Cody Trading Co.
Deer Lodge, Mont.	Hercules	Cockrell Com'l Co.
Denver, Col.	Hercules	Timpte Bros.
Dillon, Mont.	Hercules	T. J. Mulany
Dublin, Ind.	Hercules	John Newbold
Falmouth, Mass.	Koehler	Crocker Garage
Ft. Benton, Mont.	Hercules	McGinley & Allen
Ft. Collins, Col.	Hercules	George Campbell
Ft. Morgan, Col.	Hercules	O. H. McGrew
Florence, Col.	Hercules	H. M. Fox
Forsyth, Mont.	Hercules	L. W. Robinson
Frazee, Minn.	Hercules	Frazee Imp. Co.
Glendive, Mont.	Hercules	W. B. Smalling
Grand Junc., Col.	Hercules	William Murr
Grant, Ky.	Hercules	G. S. Walrath
Greeley, Col.	Hercules	Van Seckle & Co.
Havre, Mont.	Hercules	Havre Auto Co.
Helena, Mont.	Hercules	C. H. Fortman
Holyoke, Col.	Hercules	J. A. Paterson
Howard, S. D.	Hercules	S. T. Radcliff
Humboldt, S. D.	Hercules	A. S. Olsen
Jersey Shore, Pa.	Hercules	John C. Irvin
Kemmerer, Wyo.	Hercules	Up-to-Date Auto Co.
Kutztown, Pa.	Hercules	J. H. Stump
Lander, Wyo.	Hercules	Cole & Co.
Lavina, Mont.	Hercules	Phillips & Krueger
Le Suerur, Minn.	Hercules	Laurie Marx
Lock Haven, Pa.	Hercules	Ed. Bagley
Lone Wolf, Okla.	Hercules	Warren & Jamison
Loveland, Col.	Hercules	J. A. Benson
Lykens, Pa.	Hercules	S. G. Morton
Manchester, O.	Hercules	McCormick Auto Co.
Marble Rock, Iowa.	Hercules	L. M. Smith
Mead, Col.	Hercules	Kitts & Ballinger
Miles City, Mont.	Hercules	Myers & Lindeberg
Mitchell, S. D.	Hercules	J. A. Naeve
New Orleans, La.	Koehler	Acme Automobile Co.
New Plymouth, Idaho	Hercules	A. Meyer
Paynesville, Minn.	Hercules	Witt Auto Co.
Peckville, Pa.	Hercules	Mid Valley Garage
Pine Bluff, Wyo.	Hercules	C. E. Carlstrum
Plains, Mont.	Hercules	C. C. Willis
Point Marion, Pa.	Hercules	A. S. Maple
Red Lodge, Mont.	Hercules	Edward Olcott
Rockport, Ind.	Hercules	Richards & Agnew
Rocky Ford, Col.	Hercules	C. J. Lackey
Sistersville, W. Va.	Hercules	Diamond Garage
Shinston, W. Va.	Hercules	Richardson Bros. Gar.
Springfield, O.	Koehler	Springfield Millwright Co.
Strattenville, Pa.	Hercules	M. M. Fairman & Son
Three Forks, Mont.	Hercules	E. C. Waddell

MAYO Electric Garage Pump—The Mayo Mfg. Co., Chicago, has put on the market a new design of electric garage pump, Fig. 1. The equipment consists of a two-cylinder pump, driven by .25-horsepower electric motor through silent chain drive. The pump is kept cool by a constant flow of water around the water-jacketed cylinder supplied from the water tank located over the electric motor. To eliminate any chance of burning out the electric motor by starting against too heavy a resistance an auxiliary tank is located under the pump. This is fitted with a check valve outlet with a hose which connects with the tire valve. It also is fitted with a pet cock which opens automatically when the starting switch is turned off. Consequently the motor is always started up against the pressure of the empty tank, permitting it to speed up before it encounters the heavy tire pressures. The outfit is mounted on a heavy oak base fitted with castors and the long handle is required for moving it about. Ten feet of electric wire, 12 feet of hose and a gauge are supplied. The oiling system is designed to prevent oil getting into the tire so that strainers or oil separators are not necessary. The outfit sells for $75.

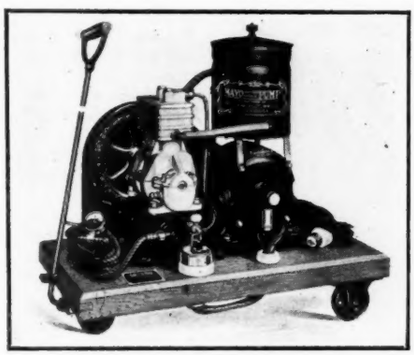

Fig. 1—Mayo electric garage pump

Auto-Comfort Robe.—There is no time that a good robe is more appreciated by the experienced motorist than in the heat of summer, for there is always the possibility of running into rainy weather or experiencing a cold spell, especially in the mountains, that will make a robe almost a necessity.

An interesting all-the-year-round robe is manufactured by L. W. House & Co., Gloversville, N. Y., and illustrated in Fig. 2. As a study of the illustrations will show, this robe can be used in many ways: as a foot warmer, lap robe, or chest protector, and in cold or rainy weather it can be made to completely cover the occupants so that it is not necessary to carry any other wraps.

When the robe is used as a chest protector, the hands, arms and chest as well as the lower part of the body are thoroughly covered and protected from the wind and cold, yet a slight jerk will instantly free each individual.

This robe, which is patented, is manufactured from fur, velour and mackinaw cloth.

In addition spring and summer weight comfort robes for dust protection, as well as warmth on cool evenings, are manufactured by this concern.

St. Louis Battery Charger—To make it possible to charge batteries from an alternating circuit such as is supplied to the ordinary incandescent lamp, the St. Louis Electrical Works, St. Louis, Mo., has announced a mechanical device, Fig. 3, which changes the alternating current into direct at a lower voltage.

Its operation is very simple. The plug provided with the battery charger is screwed into a convenient lamp socket and the current switched on and then the battery is connected.

The advantages claimed for it are that it will charge a dead cell in the proper direction, will not harm the battery by an overcharge, automatically gives the battery a tapered charge, is small and light, will operate on circuits of wide variation of voltage and frequency and does not cost much to run.

It is guaranteed to give satisfactory service and it may be returned if it does not do so.

The price for the 6-volt, 6-ampere size without ammeter to operate from a 100-volt, 60-cycle circuit is $20.

Smooth Cut Grinding Powder—The Smooth Cut Powder Co., Flint, Mich., is manufacturing a grinding and lapping powder for grinding automobile valves, lapping pistons and rings into cylinders and making gas and watertight joints. It contains no emery or metallic substances and does not adhere to the metal so that it can readily be washed off with gasoline or kerosene.

A particular advantage claimed for this compound is that only one grade is required for roughing and finishing. It retails for 40 cents per can.

Automatic Monkey Wrench—The Automatic Wrench Co., Boston, Mass., is manufacturing the Barnsley automatic wrench. This is a quick-acting wrench, which can be quickly adjusted to size and can be used with one hand. It opens automatically, locks automatically and is instantly adjusted. There are no screw adjustments of any kind. There are no teeth and no ratchet. The Barnsley is operated by placing the object to be turned between the jaws and pressing the jaw in until it strikes the object. The patent automatically locking clutch locks it in position. A slight pressure on the clutch and the jaw springs open.

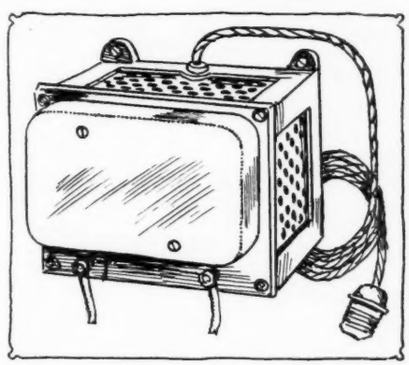

Fig. 3—St. Louis battery charger for charging storage batteries from alternating current lighting circuits

Fig. 2—The Auto-Comfort robe, showing from left to right, the foot pockets, its use as a lap robe, and method of making it into a chest protector

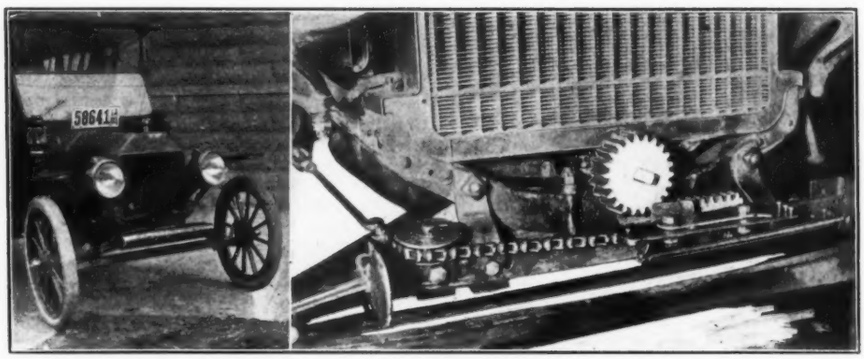

Fig. 4—Two views of Murphy starter, the left one showing its appearance on a Ford, and the right the rack and pinion mechanism which is actuated by a pedal on the foot boards

It is stated that it can be adjusted to one-thousandth of an inch. It is made in four styles, one of which is the S type.

Murphy Starter—For small cars, and especially Fords, a new starter, Fig. 4, is being put upon the market by the Murphy Starter Co., Ida Grove, Ia. It is a mechanical type in which the cranking force is supplied by the foot through a pedal located within easy reach of the driver's feet. Pressure on this lever operates a rack and pinion, the motion being transmitted from one to the other by means of a cable and a chain. The pinion replaces the ordinary starter handle and engages the crankshaft in the same way that the starting handle is engaged. The price of the device for Ford cars is $35 and for larger cars, up to $45.

One-Ton Electric Hoist—The Pawling & Harnischfeger Co., Milwaukee, Wis., is making a 1-ton electric hoist, Fig. 5, that operates on a mono-rail and which is designed to be propelled either by motor or by hand, as desired.

It is stated that it will replace from three to ten men and can be used with great advantage in handling motor and chassis assemblages, etc. It can be quickly installed as it is only necessary to attach the rail to the ceiling.

Another great advantage of the mono-rail system lies in its flexibility. It may be extended indefinitely and it can be made to reach out of the way corners and to cover irregular areas. Different tracks may be connected by means of switches and turntables.

M. P. Motor Tire Pump—The National United Service Co., Detroit, Mich., is marketing a two-cylinder power pump, designed to be connected to the motor car engine. The cylinders are 1½ by 1⅝ inches in size. The oil is prevented from getting to the tire by means of a patent air trap. The pump can be mounted by any garageman in any car at small cost, it is stated. Including hose and coupling, the pump costs $25.

Fuller Unit Gearset—Fuller & Sons Mfg. Co., of Kalamazoo, Mich., are now making deliveries of their new Model LV two-speed and reverse, unit power plant, sliding gearset and dry plate multiple disc clutch for cyclecars and similar light vehicles.

The transmission, complete with clutch, weighs only 24½ pounds, and will handle four-cylinder motors 2¾ by 4 and cars weighing up to 1,200 pounds. It has an aluminum case made of the best quality of No. 2 aluminum alloy, hardened 3½ per cent. nickel steel gears, hardened and ground main and countershafts, single row annular ball and Non-Gran phosphor bronze bearings. A drop-forged yoke and hardened and ground yoke bar operate the sliding gear.

The six-facing clutch has the best grade of Raybestos facings which are riveted to saw blade steel discs. The discs are hardened and run with hardened steel pins. A ball thrust bearing with hardened and ground steel plates is used.

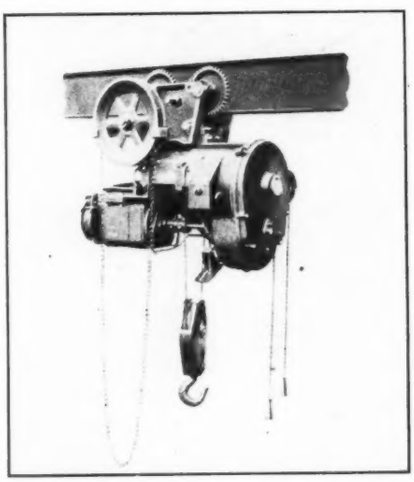

Fig. 5—One-ton electric hoist, which operates on a monorail. The one illustrated is propelled by hand, but the hoist can be motor-driven, if desired

The clutch has large wearing surface, which means long life with no trouble.

The transmission may be taken from the motor by taking out twelve bolts. Clutch and transmission covers may be removed with a screw driver.

With a 2 to 1 gearing on low speed the motor does not have to be raced in order to get into high speed. Also, on average hills this gives a good reduction, which allows a good car speed with a moderate motor speed. This adds much to the comfort of passengers. It also saves wear and tear on the motor and saves gasoline. By having a clutch with large slipping area, a start can be made from either high or low speed under nearly all road conditions. Low speed is used only for starting and in very bad places or on steep hills.

Koklip Mats—F. Cortez Wilson & Co., Chicago, Ill., has recently put on the market a high grade fiber door mat, Fig. 6, that is readily attached to any running board by means of strong tempered steel springs which project underneath and clamp tight. It can be readily removed when desired. Another style with a heavy steel frame all around is also manufactured.

The mats are made in three sizes: 8 by 14, 9 by 16 and 10 by 14 inches, and the price with heavy steel frames is $3.50 each and with clips and spring ends, leaving sides exposed, the price is $2.50.

For preserving the appearance of running boards on demonstrating cars clips and springs for rubber matting are sold for $1.25.

Zone Asbestos Brake Lining—Brake linings by mail is the novel method the Zone Asbestos Brake Lining Co. has adopted for marketing its product. In this way the brake lining goes right from factory to owner and can thus be retailed at a minimum price.

The brake lining is closely woven and is composed of 95 per cent. asbestos. It is stated that it is oil, water, grease and heat proof. Brake linings, complete with rivets, for Ford cars, with postage prepaid, sell for 70 cents, and an idea of the prices of the other linings can be obtained by quoting the 2 by 3/16-in. lining as an example. This sells for 30 cents a foot.

Miller Safety Always Book—A small booklet has recently been issued by the Miller Rubber Co., Akron, O., on the interests of safety, the title of the book being "Safety Always," and the rules to be observed for safety in various cities are given.

Connected with traffic ordinances covering cities in Ohio, New York, Pennsylvania, Indiana, Michigan and Illinois there are special pages devoted to care in driving, rules covering road rights, hints on the prevention of nuisance committed by joy riders and thieves, police traffic signals and the "Twelve Commandments" of driving.

Harwood Cigar Lighter—A combination cigar lighter and cutter for use on motor cars is being marketed by C. F. Harwood, Boston, Mass.; this lighter requiring slight pressure with the thumb for cigar clipping and turning on of the current. The burner then is ready to light the cigar. When the finger is released current is automatically shut off. The lighter, as it is marketed, comes equipped with hook and eye for fastening and 6 feet of cord with plug attachment. It sells for $2.50.

Sturges Shock Absorbers for Fords—The Pacific Leather Works, Oakland, Cal., is marketing a special coil spring type of shock absorber for Ford cars. This consists of a barrel type absorber interposed between the engine spring and the axle. It is constructed with steel drop forgings and the smoothers add 36

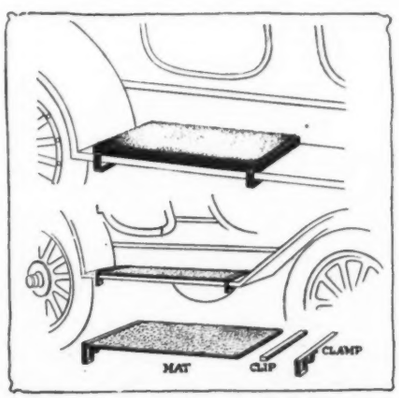

Fig. 6—Koklip mats. The upper view shows a mat with a heavy steel frame running all around it, the middle one shows the mat held by clips, and the lower illustrates the various parts comprising the clips

feet of chrome vanadium ribbon spring to the Ford suspension. It is said to be very easy to apply as no drilling or fitting is necessary. Twenty-five dollars is asked for a set of four.

Abco Lite-Controller—A device, Fig. 7, that serves to prevent an excess of current passing to the lamps whenever the motor is raced on those cars wherein magneto current is used for lighting, has been brought out by the American Battery Co., Chicago, Ill. It is called a Lite-Controller. This device is especially adapted to Ford machines.

In its construction a choke control is employed which generates a back pressure, low in amount at normal speeds but sufficient under high speed to prevent the burning out of the lamps by automatically choking the volume of the current. Under normal operation the device, due to its low electrical resistance absorbs but a nominal amount of current and the brilliancy of the light is not affected.

Means for controlling the current within a considerable range are provided for the reason that some magnetos are stronger than others, and it is not feasible to have the same adjustment for all. When the lever is at the extreme left, or on the first button, the current is entirely off. Normal operation is secured and proper control maintained when the button is at the extreme right. On the second button the maximum checking effect is had and when the magneto current is to be conserved or the headlights dimmed the lever may be put on this button. To meet all magneto conditions three additional steps are provided.

The Abco Lite-Controller is simple in construction, all-metal and is neatly finished. It takes up 3.375 inches on the dash board or cowl and is mounted the same as the ordinary two-point lighting switch which it supplants. The connection posts pass through the dash and to these the connections should be made, one wire running to the magneto and the other to the lights.

J-M Shock Absorber—An inclosed spring type of shock absorber, Fig. 8, that is designed to replace the spring shackles has recently been brought out by the H. W. Johns-Manville Co., New York City. These shock absorbers are to sell at $15 per pair and are made for cars up to 3,500 pounds. For use on Ford cars, the shock absorber will be supplied with a special spring perch to take the place of the Ford spring perch. At a little later date a J-M shock absorber for cars of over 3,500 pounds will be announced.

The construction of this device is extremely simple, employing a unique telescopic, volute compression spring of vanadium steel housed in a cylinder, the upper end of the cylinder being attached to the lower spring eye bolt and the telescopic member of the shock absorber, to which the spring is attached, being fastened to the upper spring eye bolt.

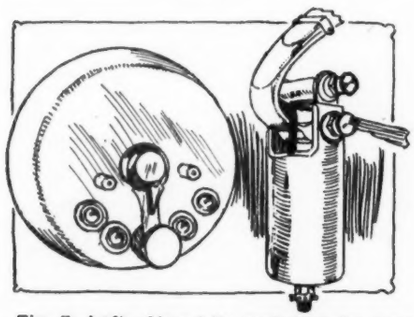

Fig. 7—Left—Abco Lite-controller for regulating the brilliancy of the headlights when the magneto is used as a source of current

Fig. 8—Right—J-M shock absorber for cars up to 3,500 pounds

Gould Storage Battery—Several detail improvements have recently been made in the storage battery manufactured by the Gould Storage Battery Co., 30 East Forty-second street, New York City. The new battery is illustrated in Fig. 9, in two forms.

The plates are of a special type which assures low internal resistance and the active material of the positive plate is said to be harder than that ordinarily used, thus wearing more evenly and making it possible to use a battery with little excess capacity.

A large settling chamber at the bottom of each jar provides for long use without cleaning and thick, rugged separators guard against short circuits. The pillar posts are copper reinforced and the connectors are of copper imbedded in lead so as to reduce the resistance between the cells. The arrangement of the cover is clearly illustrated. Each cell is inclosed by two hard rubber covers and an intermediate layer of sealing compound in adhesive contact with the sides of the jar. Sleeves of corrugated rubber provide some flexibility at the pillar posts, yet make an air-tight joint with the sealing compound.

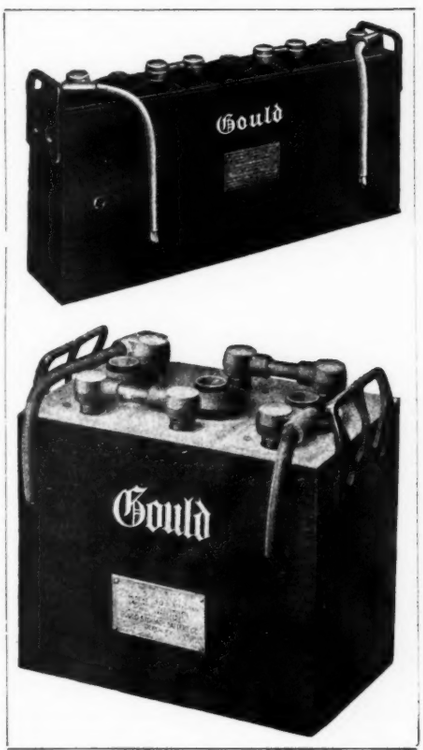

Fig. 9—Two types of storage batteries manufactured by the Gould Storage Battery Co., New York City

Integral with the lower cover is a large expansion chamber communicating with the interior of the cell and provided with a threaded cover. Leakage through the vent is guarded against by the inverted conical shape of the cap, and the removal of the cap provides for inspection and testing of the electrolyte.

The Gould battery boxes are made to the dimensions recently adopted as standard by the S. A. E. and are coated with acid-proof paint. An end-to-end arrangement is available which reduces the thickness to 4.5 inches in the largest size permitting the battery to be suspended between the chassis frame and the running board, concealed by an apron.

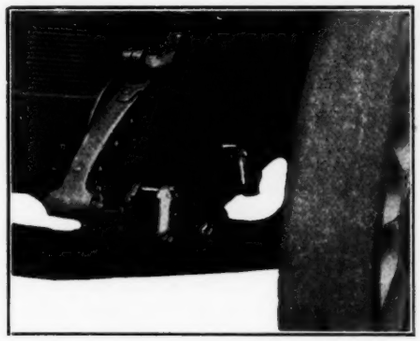

Fig. 10—Brown oil boxes attached to a half-elliptic spring

Brown Oil Boxes—To provide for the proper lubrication of the springs of the car the Brown Trafilog Co., Rose Building, Cleveland, O., has recently brought out a device called an oil box, which is designed to be attached to the springs, as shown in Fig. 10. One box is bolted on each side of each clip, and therefore on a three-quarter elliptic there would be three boxes.

The boxes contain pads which are saturated with oil and this works into the spaces between the leaves of the springs, loosens the rust and stops the squeaks, and also makes the car easier riding, it is stated. If the springs are very rusty the pads should be saturated with one-fourth kerosene, otherwise any ordinary lightweight oil should be used undiluted.

The clamps are attached to the sides of the leaves with the oil holes up and from 6 to 9 inches from the clip. Various sizes are made to correspond with the different sizes of springs.

Icy-Hot Bottles—Increased strength is the feature of the latest bottles manufactured by the Icy-Hot Bottle Co., Cincinnati, O. These bottles are insulated by a vacuum between the outer casing, which is made of metal, and the inner part, which holds the liquid, and is made of glass. The neck of the bottle is held in the metal casing by a rubber ring and at the base of the glass bottle there is a padded spring which absorbs the jars and jolts due to falling over and dropping.

Every Icy-Hot is guaranteed to keep hot liquids hot for 24 hours or cold liquids cold for 3 days, regardless of outside temperatures. Several convenient styles are made for the automobilist. A tourist style sells for $2.50 and $3.50 in pint and quart sizes when finished in nickel plate, and when leather trimmed they cost $1.25 and $2.25 extra. There are many other types, and in addition convenient cases for carrying two or more bottles are made.

Hinson Endless Fan Belt—At the low price of 25 cents the C. & B. Hinson Co., Cincinnati, O., is marketing an endless fabric belt for Ford cars. This belt is made of linen and cotton fabric tape, put together by special machinery. It is wound into a four-ply endless belt, then stitched with six rows of linen thread. It is said to be proof against oil, heat and water and will not stretch, and, furthermore, that it is three times as

strong as a leather belt of the same thickness.

Search Sign Lamp—Every motorist knows how hard it is to read signs along the road at night, it generally being necessary to dismount from the car and grope one's way to the sign post and then read the directions by the uncertain light of a match.

To overcome this difficulty a lamp, Fig. 11, that can be clamped to the windshield or any other convenient place has been brought out. It has an adjustable swivel action and thus can be moved in any position and clamped there. A handle on the back facilitates its movement. It is lighted by electricity. The price is $10.

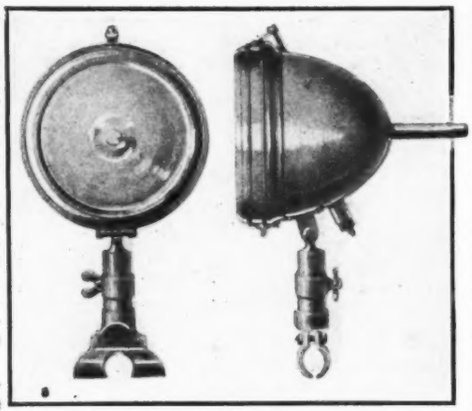

Fig. 11—Search sign lamp, which is for reading signs along the road

Isometric Sketching Paper—A specially ruled paper, Fig. 12, to enable the designer or draftsman to make sketches or drawings in isometric perspective without difficulty and without the necessity of understanding the principles of free hand drawing has been brought out by the N. W. Henley Co., New York City.

Shop details and assembly drawings can be quickly drawn on it and thus a great deal of time can often be saved because one drawing can be made to take the place of three. It also has the advantage that it is easier to understand a drawing in perspective.

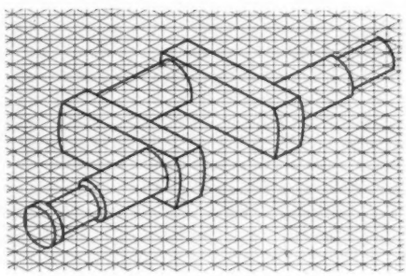

Fig. 12—Isometric sketching paper to enable a draftsman to make drawings in isometric perspective

Houdaille Shock Absorbers—Houdaille shock absorbers, made by Leuaous, Paris, France, and distributed in America by the Benz Automobile Sales Corp., New York, N. Y., operates on a principle identical with that of the recoil absorbing device used on cannons. The compensating suspension is made positive by a rotary paddle piston compressing castor oil and forcing it through by-passes provided for the purpose, the oil thus forced by abnormal pressure through the by-pass automatically deadens the jar. The recoil is eliminated by action of the oil being returned from the compensating reservoir by means of such. These list at $90 per set of four.

Spare Tire Holder—Patent papers have just been issued to Wilbur N. Urskine, Evansville, Ind., on a locking spare tire holder, Fig. 13, and is to be put on the market by him, manufacturing arrangements having been practically completed. The tire holder consists of a Y-shaped standard, which is bolted in an upright position to the running board or to the rear of the car, the ends of the wire taking the tire or demountable rim. A feature of the device is the locking arrangement by which a clamp is placed over the lower portion of the rim and held by a pin to the standard, which in turn carries the padlock, thus preventing theft of the tire.

F. & H. Drip Pan—A drip pan that need never be cleaned and therefore is especially adapted to garages and showrooms is announced by the Foss-Hughes Co., Philadelphia, Pa. This pan is in the form of a wooden retainer which holds a number of sheets of detachable oil-proof paper, as shown in Fig. 14. As each sheet becomes soiled it is removed the same as a sheet is torn off of a pad of paper, and in this way a clean surface is obtained without the necessity of cleaning the pan. The pan sells for $5.

Chicago Dimmer—To eliminate the glare of the headlights, and thus allow the motorist to use his headlights in the city without breaking the law and also to make driving in the country more safe for approaching cars and other vehicles and pedestrians, the Chicago Dimmer Co. has brought out a simple shutter device made of translucent material which can be easily attached to any lamp in 15 minutes by simply unfastening the reflector from the lamp door, inserting the Dimmer back of the glass and fastening the reflector in place again.

The Dimmer is opened and closed by a slight movement of a handle placed within easy reach of the driver and when closed gives a perfectly diffused light. The device has been approved by the Board of Motor Headlight Inspection, Chicago, Ill., and is sold for $7.50, f.o.b. Chicago.

El Arco Radiators—A pointed, V-type radiator for the Ford car is one of the specialties of the El Arco Radiator Co., New York.

Stickalite—Repairs or adjustments at night by the roadside are greatly facilitated when there is a good light to work by and acting on this idea the Premier Electric Co., 4048 Ravenswood avenue, Chicago, Ill., has put on the market an electric lamp with a magnetic base. The lamp is designed to be operated from the ordinary 6-volt circuit and will stick to any iron or steel surface. It weighs 3 ounces and the magnet has a pull of 50 times this amount so there is no possibility of the lamp not staying where it is placed. A sufficient amount of cord is furnished with the lamp and a standard Ediswan socket is provided. The price is $1.

Gray & Davis Book—A Little Journey Through a Great Factory, is the title of an interesting and instructive book that is published, for private distribution by Gray & Davis, Inc., Boston, Mass., manufacturer of starting and lighting systems, and electric lamps for automobiles. The book consists of 40 pages of half-tone pictures of the company's factory and presents in an interesting way the details of electrical instrument manufacture and in addition it shows the care that has been taken in providing a pleasant and healthful place for its employees.

Quick-Tite Patch—A patch, in the form of a roll 15 inches by 3 inches, placed in an air-tight, oil-proof, fibre case with a pair of shears, making a complete repair kit for inner tubes, is made by the Quick-Tite Patch Co., Amsterdam, N. Y.

To use the patch, clean the tube with gasoline in the same manner as when any patch is applied. Then cut off the proper sized patch and clean the prepared side thoroughly and press it into place with the fingers. Place the tube in the shoe and inflate to the required pressure. A permanent repair is the result and the hotter the tire becomes the tighter the patch sticks, it is stated.

The patch and the outfit that goes with it retails for $1.

M & M Bodies—The M & M Co., Cleveland, O., has for sale a limited number of new four-door, streamline bodies, already painted and upholstered. It is stated that it cost $350 to make these bodies and they are offered at $85.

The bodies are painted maroon, dark brown and dark green and are upholstered with genuine first quality leather, it is said. There is room under the front seat to accommodate a large tank and the cowl is arranged for the insertion of electric lights, speedometer, etc.

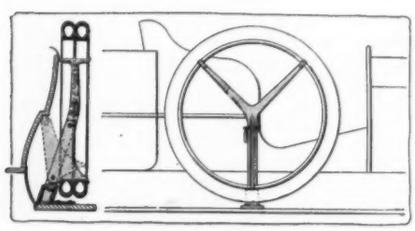

Fig. 13—Urskine spare tire holder

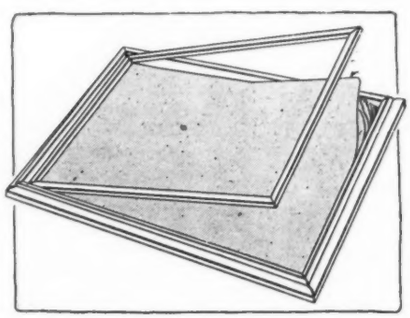

Fig. 14—F & H drip pan

Fig. 15—Chicago headlight dimmer